

BRUARY 19, 1942

The

FEB 20 1942

# IRON AGE



Fairbanks Dial Scale head with Printomatic Weigher. Press a button and the weight is printed on a ticket, roll tape, or ticket and tape . . . even on sheets 18 inches wide!

## Speed without ERROR!

Speed production with modern Fairbanks Scales. They weigh faster! They weigh automatically, without human error! They even weigh materials on the move . . . print records and receipts . . . count small parts and products.

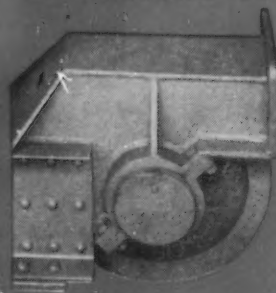
Investigate the advantages of today's Fairbanks Scales. Our engineers are at your service. Write Fairbanks, Morse & Co., Dept. B-38, 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.

FAIRBANKS · MORSE  SCALES

DIESEL ENGINES ELECTRICAL MACHINERY MAGNETOS RAILROAD EQUIPMENT WASHERS-IRONERS  
STOKERS PUMPS MOTORS WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS



### Rotating Axle Bearings Reduce Noise and Wear in WHITING CRANES



Wheels are kept in perfect alignment, running true and free. Wheels and rails last much longer.

If it's a Whiting crane, it's designed and built for quiet operation and long wear. Every vital point is protected against unnecessary friction — your insurance against breakdown, time out for repairs, and interrupted production.

Noise in a crane is a danger signal that should be eliminated. In Whiting cranes, every effort has been made to do away with noise from the day of installation. Heavy duty roller bearings keep all gears in permanent alignment. Smooth-running herringbone gears outlast spur gears two to one. Tapered-tread drive wheels keep the bridge square, reduce binding. Flexible couplings cushion the shock of starting, eliminate strain on the shaft bearings, and transmit power without noise. Capacities from one to 400 tons. Also electric hoists from ½ to 7½ tons. Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois. Builders of quality cranes for over 50 years.

Send for Booklet "HOW TO WRITE A TRAVELING CRANE SPECIFICATION"



# WHITING *Quiet-Running*

## OVERHEAD TRAVELING CRANES



FEBRUARY 19, 1942

VOL. 149, NO. 8



J. H. VAN DEVENTER  
President and Editor

C. S. BAUR  
Vice-President and General Manager

Managing Editor, T. W. LIPPERT  
News & Markets Editor, J. A. ROWAN  
Technical Editor, F. J. OLIVER

Associate Editors

D. R. JAMES  
W. A. PHAIR T. E. LLOYD  
Art Editor, F. J. WINTERS

Editorial Assistants

M. M. SCHIEN G. B. WILLIAMS  
J. I. BUTZNER S. H. BARMASEL

Washington Editor

L. W. MOFFETT

Resident District Editors

T. C. CAMPBELL HERMAN L. KLEIN  
Pittsburgh Chicago  
B. W. CORRADO W. F. SHERMAN  
Cleveland Detroit

CHARLES POST  
San Francisco

Editorial Correspondents

W. P. DEARING ROBERT G. McINTOSH  
Buffalo Cincinnati  
G. FRAZAR R. RAYMOND KAY  
Boston Los Angeles  
HUGH SHARP JOHN C. McCUNE  
Milwaukee Birmingham  
F. SANDERSON ROY M. EDMONDS  
Toronto, Ontario St. Louis  
L. W. ALLISON C. H. BACON  
Newark, N. J. Seattle

A. H. DIX, Manager Reader Service

Advertising Staff

Emerson Findley } 621 Union Bldg., Cleveland  
Robert F. Blair }  
B. L. Herman, Chilton Bldg., Philadelphia  
H. K. Hottenstein, 1012 Otis Bldg., Chicago  
H. E. Leonard, 100 East 42nd St., New York  
Peirce Lewis, 7310 Woodward Ave., Detroit  
C. H. Ober, 100 East 42nd St., New York  
W. B. Robinson } 428 Park Bldg., Pittsburgh  
W. J. Fitzgerald }  
D. C. Warren, P. O. Box 81, Hartford, Conn.  
O. L. Johnson, Market Research Mgr.  
B. H. Hayes, Production Manager.  
R. E. Baur, Typography and Layout.

Member, Audit Bureau of Circulation  
Member, Associated Business Papers  
Indexed in the Industrial Arts Index. Pub-  
lished every Thursday. Subscription Price  
United States and Possessions, Mexico, Cuba,  
and South America, \$6.00; Canada, \$8.50;  
Foreign, \$12.00 a year.  
Single copy, 25 cents.  
Cable Address "Ironage N. Y."

Owned and Published by  
CHILTON COMPANY  
(Incorporated)

Executive Offices Editorial and  
Advertising Offices  
Chestnut and 56th Sts. 100 East 42nd St.  
Philadelphia, Pa. New York, N. Y.  
U.S.A. U.S.A.

OFFICERS AND DIRECTORS

C. A. MUSSELMAN, President

JOS. S. HILDRETH, Vice-President  
GEORGE H. GRIFFITHS, Vice-President  
EVERIT B. TERHUNE, Vice-President  
J. H. VAN DEVENTER, Vice-President  
C. S. BAUR, Vice-President

WILLIAM A. BARBER, Treasurer  
JOHN BLAIR MOFFETT, Secretary  
JULIAN CHASE, THOMAS L. KANE,  
G. C. BUZBY, P. M. FAHRENDORF,  
HARRY V. DUFFY CHARLES J. HEALE

This Week in . . .

# THE IRON AGE

## Editorial

Sales and Production . . . . . 37

## Technical Articles

Bolivia and Tin . . . . . 39  
Casting Racks Speed Production . . . . . 45  
Plating of Alloys . . . . . 46  
Silver as a Substitute for Scarce Metals . . . . . 48  
Metal Powders . . . . . 49  
Government Specifications for Aircraft Steel . . . . . 62  
Report of A.I.M.E. Meeting . . . . . 54  
New Equipment . . . . . 66

## Features

Assembly Line . . . . . 70  
Washington . . . . . 74  
West Coast . . . . . 78  
Fatigue Cracks . . . . . 82  
Dear Editor . . . . . 84

## News and Markets

This Industrial Week . . . . . 86  
News of Industry . . . . . 89  
Personals and Obituaries . . . . . 122  
Pipe Lines . . . . . 125  
Machine Tool Activity . . . . . 126  
Non-Ferrous Metals . . . . . 127  
Scrap Markets . . . . . 128  
Iron and Steel Scrap Prices . . . . . 130  
Comparison of Prices . . . . . 131  
Finished Steel Prices . . . . . 132  
Warehouse Prices . . . . . 133

Products Advertised . . . . . 146  
Index to Advertisers . . . . . 185

Copyright, 1942, by Chilton Company (Inc.)



# it's a "POWER BANK" for America's Aircraft Industry



**DEPOSIT A-C POWER...  
withdraw accurately controlled surges of D-C current  
for more uniform welding of aluminum**

Tough job, aluminum welding. You need comparatively high voltage in a narrow current range. Aluminum and other alloys used in modern planes have a very narrow plastic range. How to get the exact welding current you need without disruptive surge demands on power systems, without installing costly auxiliary equipment, has long been a problem.

CONDENS-O-WELD solves the problem. Energy is drawn from a 3-phase a-c power line, rectified, stored electrostatically and released in accurately controlled discharges to the welding machine. A complete, compact, enclosed unit, Condens-O-Weld can be used with any electrostatic stored energy type resistance welder.

With precision control of voltage, current and wave form, aircraft producers are getting welds of uniform strength and soundness not possible

with any previous method. If your welding problem demands action now, you'll be glad to learn that Condens-O-Weld units are *ready now!* For detailed data, write Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., Dept. 7-N.

## 2 WAYS

**CONDENS-O-WELD HELPS  
KEEP PLANE PLANTS AT  
PEAK EFFICIENCY**

1. **BALANCED 3-PHASE LOAD**  
Power requirements spread over three phases, not concentrated in surge demand on a single phase.
2. **MINIMUM PEAK KV-A DEMAND**  
Fast charging rate with efficient electrostatic storage of power cuts peak kv-a demand to a minimum.



J-21173-A



# Westinghouse

RESISTANCE

WELDING CONTROL



# THE IRON AGE

° °  
FEBRUARY 19, 1942

° °  
ESTABLISHED 1855



## Sales and Production

SOMETIMES a production man will say: "I am not interested in sales problems or policies."

He ought to be. Except in abnormal times, such as the present, salesmen and selling have kept production men in jobs ever since production was invented. And if selling technique and sales organizations are allowed to get rusty during the duration, there will be a lot of production men out of jobs after the war is over.

So, if you are a production executive who would like to stay in business later, use what influence and ability you may have to help keep selling in business now.

And do not become impatient if you find that a production publication, such as THE IRON AGE, keeps harping upon this subject of selling what you've got when you haven't got it!

Perhaps you, as a production man, can help your sales department do just that. Because you, of all people, know many good things that your company may have to offer aside from its products.

You can find samples for your sales and advertising departments to send out to past, present and prospective customers.

That is what progressive and far-seeing companies are doing today; they are handing out samples. Samples of their thinking; samples of their knowledge and experience; samples of their ability to serve, even when they cannot sell.

And in doing that, they are deliberately building, brick by brick, the foundations of enduring reputation.

Did you ever stop to ponder upon how reputations are built? Reputations that make one concern want to do business with another?

In our business, they are not built upon a single fortuitous happening.

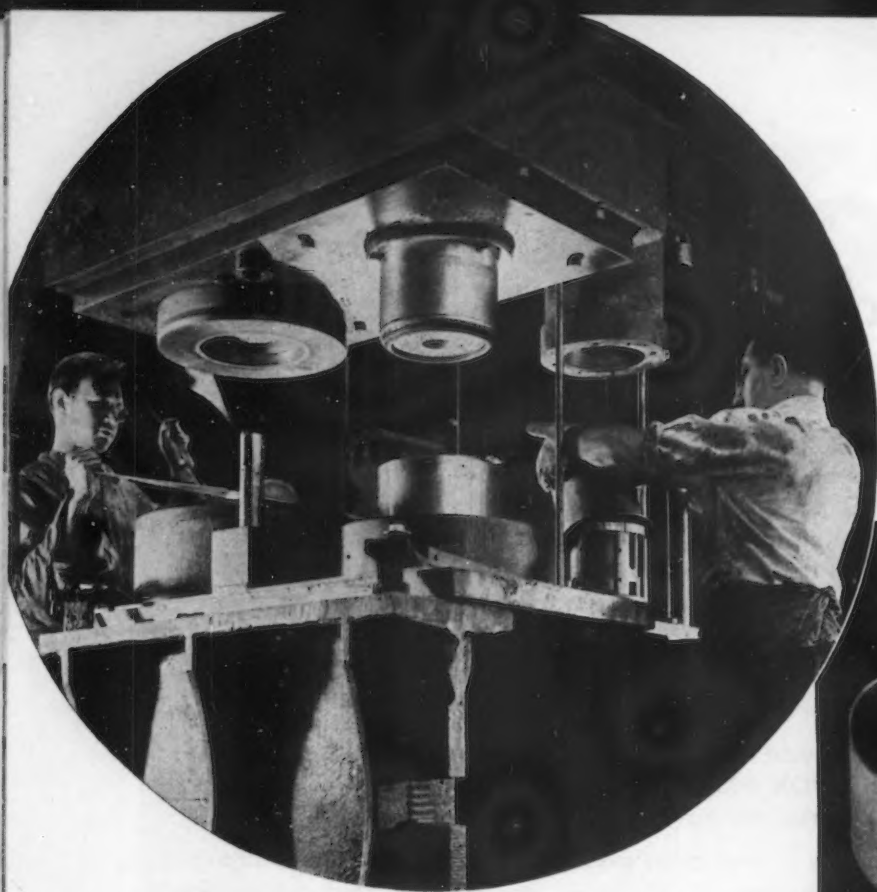
They are not even built upon the fact that one makes an excellent product. That idea expired with the death of the man who made the better mousetrap and then sat down to await the road building gang.

Today, you cannot send out samples of your product because there are none to spare.

But you can and must send out samples of your thinking; samples of your experience; samples of your ability to serve industry.

Today industry, with its personal salesmanship handicapped and hobbled by shortages and priorities, needs more than ever the services of these messengers of good will, who build and maintain industrial reputations.

*J. W. VanDusen*

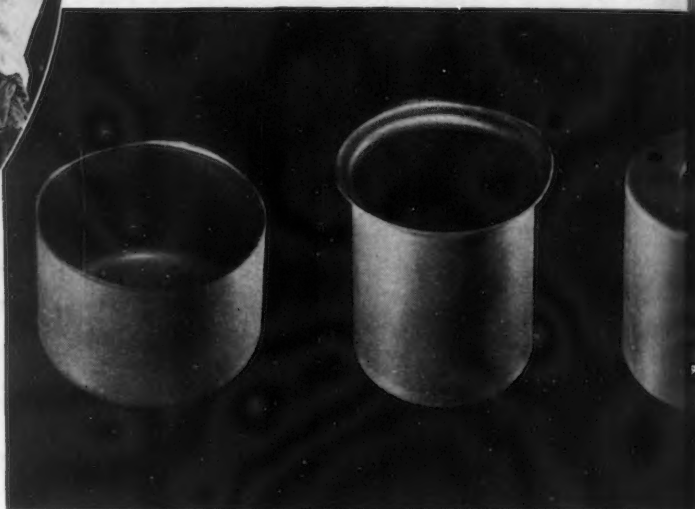


*Three dies mounted in this press blank, draw, emboss, punch and trim 8 1/8" x 8" cylinders.*

*The first die blanks and draws 6" to 10" dia.*

*The second die draws to finished size, 8 1/8" by 8".*

*The third die embosses, punches and trims, finishing the cylinder.*



## 8" Cylinder Formed and Finished at Each Press Stroke

These brake booster cylinders, 8 1/8" deep by 8" in diameter, are blanked, drawn, embossed, punched and trimmed by three dies mounted in a 250-ton, double-acting press. By this ingenious production method a cylinder is finished at every stroke of the press.

Each 13-ga. Inland sheet is trimmed to correct size for two blanks. A sheet is dipped in emulsified lubricant and set to the gauges on the first die, which cuts the blank and draws to a depth of 6" on a 10" diameter. During the upstroke of the press, the part is moved to the second die, where it is drawn to finished size, 8 1/8" deep and 8" in diameter. On the next upstroke, the part is inverted and placed in the third die, where it

is embossed, punched and trimmed—completely finished and ready for shipment. This process is made continuous by feeding the press and advancing the parts at each upstroke.

Inland special drawing quality sheets have almost a perfect performance record on this difficult brake booster cylinder job, which is drawn and redrawn without score marks.

If you have a problem involving the use of steel—perhaps arising from conversion to wartime production—do not hesitate to call for an Inland Metallurgist who will be glad to work closely with you.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATE • STRUCTURALS • PILING • RAILS  
TRACK ACCESSORIES • REINFORCING BARS

# INLAND STEEL CO.

38 S. Dearborn Street, Chicago • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati, New York



# Bolivia and Tin

**... With war in the Far East, tin has suddenly become a very critical metal. Its great importance in the industrial economy makes this informative analysis of the Bolivian situation very timely.**

By BERNARD C. BORNING

Los Angeles

**I**S this country helplessly dependent, as is often assumed, on Far East tin supplies? If the Pacific war strangles Far East sources of this vital metal, can the United States bank on Bolivia in South America to turn out the tin needed?

Tin, of course, is of pressing importance today. Too expensive for wide use in a pure form, tin combined with other metals goes into numberless manufactured goods: food cans, mirror backs, roofing, utensils, tinfoil. Now war makes tin a "strategic metal," desperately sought by the great powers because of its role in armament making: alloys, solder, coating iron and steel, etc.

Naturally, the United States is in the thick of the world scramble for tin, because it is by far the world's largest tin consumer. One month last spring U. S. *current consumption* was reported eating up almost half of all the tin the whole world was producing. Yet domestic production of this metal is approximately zero.

The world the last year or two was said to be producing tin at a rate of 230,000 to 240,000 long tons annually, a big increase over previous years. Principal producers have been (1) Malaya, (2) Netherlands East Indies, (3) Bolivia, (4) Thailand, (5) China, (6) Nigeria. Bolivia is the world's third largest producer, with only

Malaya and the Netherlands East Indies topping her. War and lack of shipping some time ago knocked China out of the picture as an exporting producer, and, as this is written, no one can predict what war will do to other Far East producing areas.

Principal consumers, on the other hand, have been (1) the United States, (2) Great Britain, (3) Russia, (4) Germany, (5) Japan, (6) France. War has cut Continental Europe, including Germany and France, largely out of this consumer picture, which means a bigger slice for any other nation who can keep sea routes open.

A glance at the names of the major producers shows four out of the six to be in the Far East, more or less within Japan's dreamed orbit. And on the consuming side, allied America, Britain and Russia—long apprehensive of the Japanese threat to their tin sources across thousands of ocean miles—have been taking steps to insure future supplies. Herein lies the explanation of why the Metals Reserve Co. has been buying up huge quantities of tin ores and pig tin above current consumption.

Since 1931, tin exports from the world's leading producing countries have been controlled by the International Tin Cartel. Bolivia was one of the original signers of the agreement. Under it, each participating nation is allotted a "standard tonnage" based on capacity to produce. Quotas are fixed quarterly as a certain percentage of this tonnage. To illustrate, during the first

two quarters of 1938, quotas were set at 70 per cent of standard tonnage, while during the last two quarters of 1938, they were restricted to 40 per cent of standard tonnage. Since then, war demands and the huge wants of the Metals Reserve Co. caused the Cartel to loosen up quotas, and at the end of 1941 they stood at 130 per cent.

Bolivia was lucky until recently in having her standard tonnage based on her peak production year of 1929, when her output was something more than 46,000 metric tons. To date, she has not again equalled this figure, even though most of her quotas since 1938 have been above it. At its London meeting last year (1941), the Cartel's International Tin Committee decided to bring standard tonnages more in line with recent production capacities. Since Bolivia had been falling behind in her quotas and stood to lose part of her allotted share in world exports, her delegates naturally tried to forestall any revision of standard tonnages. They were outvoted, and it was agreed to base the new standard tonnages on production for the twelve months ending June 30, 1941.

This spurred Bolivia to make the best possible showing before the June 30 deadline, and she did succeed in producing some 42,000 metric tons, her biggest 12-month output in 11 years. As yet this reduced standard tonnage does not restrict Bolivia, for with the present 130 per cent quotas in force, she can still pull out of all the stops.

When World War II started in

September 1939, the Bolivian mining industry seemed in for a bad time. Bottoms for shipping were hard to find, Continental markets were cut off by blockade, and customary advance payments from English smelters got scarcer. Bolivia's tungsten and antimony ores, most of which had gone to Europe, were left groping for a market. The only other big market in prospect for these metals was the United States, and U. S. industries had been in the habit of taking only very little of the purest grade tungsten and antimony, while the lack of smelting facilities for tin prohibited buying the ore direct. Since most pig tin imported into the United States came from British Malaya and the Netherlands East Indies, it seemed the only way the U. S. would make up to Bolivia was to have customary shipments across the Pacific threatened.

As it happened, the same war which cut off Bolivia's markets roused this country to action to insure tin supplies, and now brings Bolivia new markets here. The Metals Reserve Co., offspring of RFC, signed a contract with every tin mining company in Bolivia, except one, for their tin output for five years. The contract dates from July 1, 1940. This country is now buying direct part of what formerly went to Europe for smelting and subsequent re-export to us. The ore will be smelted here, and to do it the first tin smelter in the Western Hemisphere has been built at Texas City across the bay from Galveston.

On this 50-acre tract near Texas City, nations of three continents are working together on a new economic front against the Axis. Metals Reserve Co. built the plant. Tin Processing Corp., a subsidiary of a Dutch company exiled in Batavia, operates it. Bolivia supplies tin ore.

Under the deal, Bolivia furnishes about 18,000 long tons of tin a year, at 48½c. per lb. of fine. The one company not in the deal is the great Patiño Mines & Enterprises Consolidated, which recently was turning out almost half of Bolivia's total tin production. This company still ships to England, where it owns smelters. But added to the tin the U. S. has been getting from the Far East, as well as pig tin from the British smelters, the import of Bolivian ore puts an unprecedented peak on the U. S. total

tin pile. If other sources are cut off, can Bolivia carry on alone for this country?

It should be interesting to take a trip to Bolivia.

Bolivia is a land of extremes, geographically and economically. Her territory divides into two most distinct regions. Her west is a high plateau where rich mineral deposits are worked at elevations of 12,000 to 15,000 ft. above sea level. Here is the tin belt, extending from the Peruvian frontier on the north to that of Argentina on the south, a great strip 500 miles long and roughly 60 miles wide. On this "Alto Plano" live most of Bolivia's 3,500,000 people, ranking her with Tibet as one of the highest inhabited regions of the earth. Bolivia's life has centered about this high plateau for centuries—since the days she was "Upper Peru," and tributary to the Spanish viceroyalty of Lima.

Bolivia's east, forming sections of the Amazon and La Plata river basins, is a land of steaming jungle, cut off from the rest of the country by lack of roads or rail. Potentially rich and capable of producing perhaps all of Bolivia's food, these fertile eastern provinces now lie untapped and unproductive, inhabited only by small primitive tribes. Their isolation from the plateau population forces the country to buy most of its food from the outside. As one mine official put it, "Bolivia trades more with Brazil, Argentina and the United States than she does with Bolivia."

With no sea coast, the country must ship out its minerals by rail to the west, over lofty mountains to Chilean and Peruvian ports. Incoming machinery and food must travel the same difficult route, or mount the plateau by a long rail route out of the vast pampas of Argentina.

Even the more populous western plateau is only slightly industrialized by U. S. standards. Enterprises are for the most part small, tools of production crude. On this desolate desert highland, the descendants of Indians vanquished by the Spaniards tunnel and drill for tin and other minerals. The snowy peaks themselves rise to tremendous heights, yet here where the thin chill air makes exertion hard for white northerners, the Aymaras and Quechuas swing picks inside the gaping caverns left unfilled by the conquerors centuries ago.

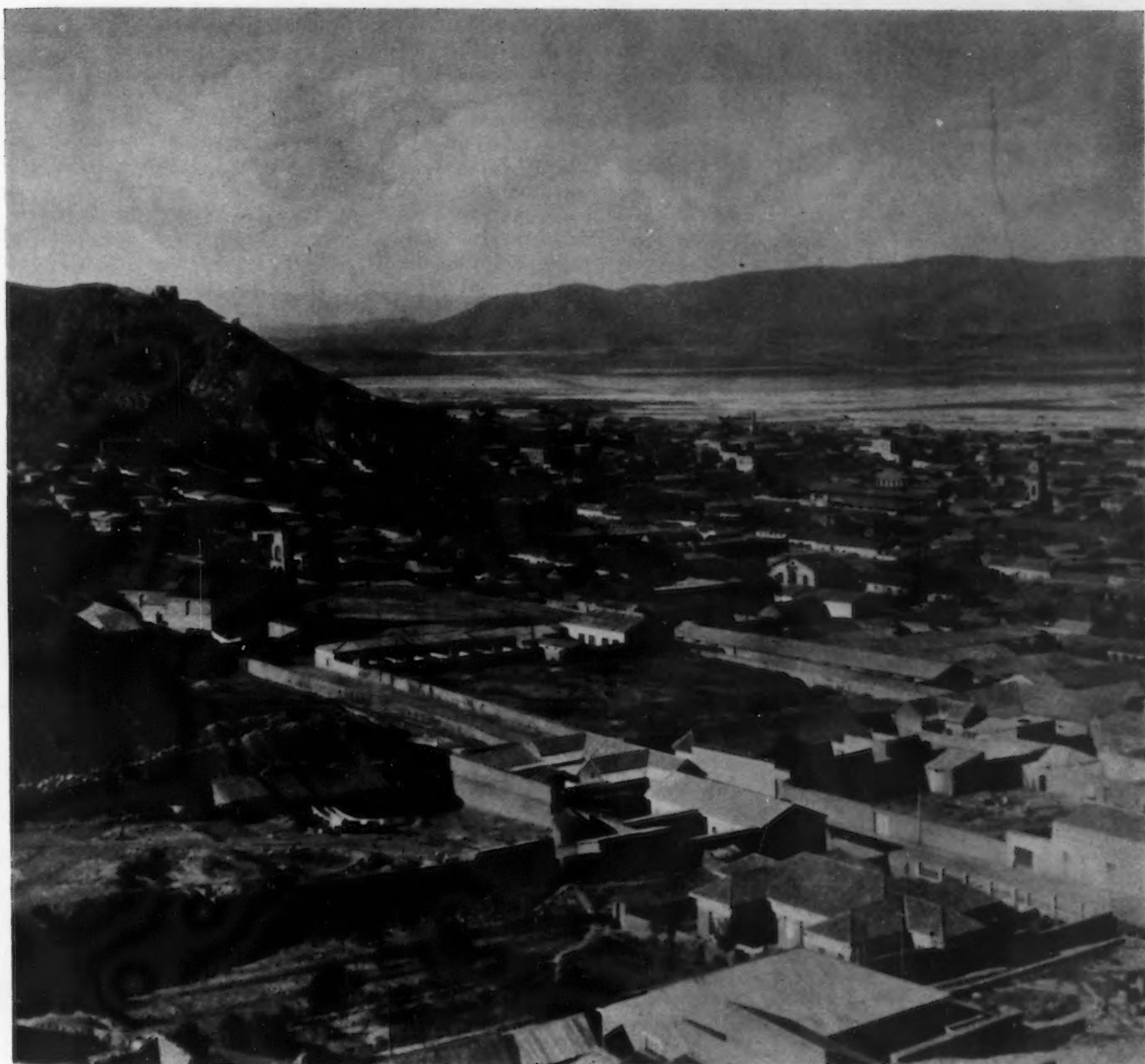
Squatting in the shadow of a mountain still scarred by the diggings of mineral-greedy Spaniards of the period of Pizarro, Indian women sort out chunks of tin ore by hand—ore hoisted in leather pouches out of the mountain through jagged, untimbered shafts.

The weird fascination of this ancient plateau should not hide a hard economic fact. Economically, Bolivia is dangerously lopsided. Perhaps no other nation on earth is so completely dependent on a single metal for its economic well-being. Minerals are about 98 per cent of Bolivia's export trade, says her Director General of Mines, and tin alone makes up some 77 per cent of that trade. Were anything to prevent these exports, the country would shortly be in distress for want of food. Tin is a grim barometer of her economic situation. Further, Bolivia is the one country where nearly half the principal mineral output is controlled by one man—Simon I. Patiño. Almost all government revenue—about 85 per cent, officials say—comes from tin. Precariously, the government feeds on a single industry, while over that one industry by which the country largely lives, hangs the constant threat of an unpredictable taxation ax.

This one major industry of Bolivia is classified into three groups, known in that country as the big, medium, and small producers. The big producers mine 75 to 80 per cent of the nation's tin, and are composed of only three interests: Patiño, Hochschild and Aramayo. The medium producers, customarily allotted 13 per cent of the nation's tin output, count close to 30 companies in their group. The small producers together yield but 10 per cent of Bolivia's tin, and in this classification fall the remaining midget companies and individuals. A committee headed by the Director General of Mines divides the nation's Cartel quota among these companies.

Many difficulties—political, economic and natural—have hounded Bolivia's tin industry. Only yesterday in her history, severe tax and regulatory laws, brought on by the hard-to-take Chaco War with Paraguay in 1932-35, weighed heavily on tin. With a treasury depleted by war, Bolivia turned on her mining companies. The culmination of this somewhat anti-capitalistic tendency was the drastic mining law of June





7, 1939. No longer were companies to be allowed to export big profits out of the country. The new law harshly taxed and regulated tin miners, required them to deposit 100 per cent of the proceeds from the sale of tin with the Central Bank. The bank paid off in bolivianos at a rate of exchange set by the government. Today's Peñaranda administration is "more enlightened," say mine people, has loosened up some of the restrictions.

Yet even today the government tries to peg the foreign exchange rate, keeps a strong hand on mining. By last June, mining companies only had to deposit 42 per cent of tin sales, instead of the previous 100 per cent. From this deposit, 30 per cent was taxed away directly, then numerous freight,

OF ever increasing importance to the United States is the tin resources of Bolivia. From 75 to 80 per cent of the tin produced by our Latin American neighbor is by three large interests, Patino, Hochschild, and Aramayo. Medium producers, numbering some 30, produce 13 per cent of the tin, and small producers together yield about 10 per cent. This mine is at Oruro, Bolivia.

o o o

handling, treatment and other charges were deducted. For the sad remnant, miners got 40 bolivianos on the dollar.

Last June, the "Cambio Unico" decree once more altered the regulations. There was still the 42 per cent deposit, but miners received 46 bolivianos to the dollar instead of the previous 40. Yet this apparent gain was largely negated by raising the direct tax on the deposit from 30 per cent to 35 per cent.

Mining people understandingly could not get enthusiastic over Cambio Unico.

To add to tin's difficulties, the labor supply has been short, especially since Chaco. Only the Bolivian Indian can take it at the high altitude of most of the mines, and a staggering proportion of this manpower was lost in the struggle with Paraguay. Some of the workers who were not killed off, fled to northern Argentina, but an attempt to re-import them proved a flop, since they preferred the easier life of their new country. Then, too, because the average grade of ore mined has sharply decreased in a decade, more men are needed today to produce a given tonnage of tin. It took nearly as many workers to turn out 28,000 metric tons in 1939

as it did to mine about 46,000 tons ten years earlier. All this is tough on production expansion. Summed up by a prominent tin official: "Bolivia simply has to wait for a new generation of miners to grow up!"

Lack of roads is another severe limitation on Bolivia's tin industry—besides limiting her whole development. Many areas that contain tin deposits, say geologists, are still inaccessible and cannot be productive until truck roads or railroads are extended. Some miners transport their ore by truck to a rail station, but from many of the small mines in the hills the ore must be hauled by pack trains of llamas or burros to the roads. From the remote Bolivian plateau itself, the ore can be hauled out only by rail through neighboring foreign countries. "It costs as much now," said a miner, "to carry a ton of tin concentrate from a Bolivian mine to the coast, a few hundred miles away, as it does from the coast to Texas City, thousands of miles away!"

To make transportation matters worse, Bolivia's limited motor-hauling facilities are at the mercy of an uncertain gasoline supply. Though her eastern region contains undeveloped oil, and she does refine a little, her gasoline production far from satisfies even her small needs. Consequently, she depends largely on the northern Peru fields for gasoline, and imports Diesel fuel, oils and greases from the United States. Last summer when the Peru-Ecuador squabble flamed into a full-fledged border war, Bolivia was left gasping for gas. West coast shipping, already pressed, seemed to have other things to haul, in place of gasoline down to the ports which connect by rail with land-locked Bolivia. Trucks were stalled, and tin output took a beating. Officials suggested reserve tanks might have to be built at west coast rail heads to smooth out the spurts in delivery. As for the petroleum products she's been buying from the States, Bolivia fears war may now restrict them, too.

Finally, by nature, Bolivia is a "high cost" producer of tin. Unlike the cheaper-to-work alluvial deposits of the Far East, Bolivia's production comes from underground, mostly from narrow veins. Very few placer deposits are being worked. Her underground tin ores are usually metallurgically more

complicated, harder to mill and refine than Far East ores. On Bolivia's dusty plateau, mining companies must constantly battle the problem of adequate water supplies for their operations. And in further contrast to Malayan and Netherlands East Indies tin areas which are close to the sea, Bolivia's tin zone is blocked from the Pacific by rugged mountains. Were it not for the quota system of the International Tin Cartel, it has been claimed, it is doubtful if Bolivian producers could compete on an open world market.

These, then, are Bolivian tin's peculiar difficulties. What about the future?

Attempts to better Bolivia's mining position by local smelting of ores have proved disappointing, in spite of study and experiment for some time. At present, only the relatively high grade concentrates can be exported because of transportation costs. Local smelting would mean the possibility of treating lower grade concentrates, resulting in higher tin recovery. Several attempts to establish smelter projects in recent years went on the rocks, with money spent by Chilean, American, Canadian and Argentine interests. One enterprise had progressed to the stage of building a reverberatory furnace on the Chilean coast, when British smelter people bought off the scheme. Prospects of Bolivian smelting in the foreseeable future are not encouraging.

In mining circles, the statement is repeatedly heard that the "future" of the country's mineral development rests on the small producer. The big fellows are already close to their production peak, it is said; the real increase in tin tons must come from the smaller enterprises. The small operator needs a place where he can take his samples for assay; where he can get advice on mining, milling, marketing; where he can get help on his transportation problem. Often he needs funds to keep him going. Limited capital and technical ignorance may lead him to work only the richest ore pockets and then quit. That is not the way to make a productive mine out of a prospect, to add a new name to Bolivia's list of producers.

The government itself senses this situation, and in 1937 set up the "Banco Minero," or mine bank, to encourage and aid smaller producers. All members of the small

producer group belong to the Banco set-up, by law, and any companies classified as medium may belong, if they choose. Banco Minero is the marketing outlet for its members; sells them explosives, picks, shovels and other types of material and equipment at cost plus 5 or 10 per cent; makes loans to the small companies; gives them free technical advice. It now plans custom mills where small producers can bring their ores for concentrating. The idea behind the Banco Minero is that it saves on overhead for financially hard-pressed little miners, gives them the benefit of large-scale buying, makes available technical help they could not afford on their own. At times the Banco even pays above market price for metals from the small producers, an official states, on the ground that whatever helps develop mining will benefit the whole country in the long run.

Another way of increasing Bolivia's tin production is frequently suggested: new deposits. Great areas of the country have never been thoroughly explored, and more prospecting might reveal considerable further deposits to be worked. With better transportation connections, miners and geologists would be encouraged to enter these now unknown regions, to develop any new tin deposits that exist. The Director General of Mines thinks alluvial tin might be found in lower eastern lands.

Further, to boost present output, and to assure a maximum total production through the years, lower grade ores must get increasing attention. Already larger mining companies are profitably working ores thought too poor to trouble with years ago. The conquering Spaniards started the short-sighted policy of skimming off only top grade ores, sometimes discarding as waste anything containing under 10 per cent pure tin. Later miners continued the tendency by sorting out only the best material dug up. Today huge dumps of this so-called waste contain surprising tonnages of tin. Some of these dumps are being reworked now, and even discard filling old mine tunnels is being remined and sent through the concentrating mills. Some mining companies report that more than half their year's production now comes from old workings and low grade material not included in "ore reserves." The mine industry begins to realize that if Bolivia's tin can-





not last forever, it can last much longer if all possible tons are squeezed from poorer ores.

But the shift to lower grade ores calls for changes—changes in mining, in handling ores outside the mine, in crushing and concentrating operations. Modern machinery for digging out bigger tonnages of this poorer material should replace some of the primitive pick and shovel scratching for only the cream. The short labor supply can be made more efficient by greater mechanization of surface work at some mines. And in many cases it must be asked if certain of the crude hand methods for recovering a fine tin concentrate from mine-run ore could not give way to more scientific and mechanized milling, as at Patiño's marvelous Oatavi mill. Today ore containing as little as  $\frac{1}{2}$  per cent tin can be profitably

**A**LMOST all of the tin produced in Bolivia was exported for smelting. About completed is a new smelter at Texas City, Texas, the first in this country, which will handle the smelting of Bolivian ore. These are the Patiño tin mines at Catair, Bolivia.

o o o

worked—with the proper set-up. It's a question of machinery, plant, and capital.

Technical men, too, are badly needed by Bolivia to help a big part of her tin industry step from the primitive to the progressive. New techniques and recovery methods could be life savers. "We have the practical miners," one is told, "but we're short on modern specialists." To train more such careerists of her own, Bolivia needs a first-rate school of mines, instead of the second-rate one at Oruro. She needed the modern metallurgical laboratory

recently completed at La Paz in the new Department of Mines building, she needs the experimental ore mill that is planned. With such things, and more, she'll be on her way.

To sum up, major problems involved in future increases of Bolivian tin production might be listed as:

- (1) Mechanization for medium and small mining companies.
- (2) Roads.
- (3) Improved methods for working low grade ores.
- (4) Technical men.
- (5) Stable laws and a sympathetic government attitude.

That's Bolivia. Now a quick round-up to see where the U. S. stands.

It has been noted that Bolivia turned out about 44,000 long tons last year (1941), a substantial increase over recent years. By com-

parison, U. S. consumption for the last decade is said to average some 60,000 long tons; in 1940 it was 74,000 tons. The following little table, based on official figures from the Ministry of National Economy, shows who in Bolivia is doing the increasing, and how much:

FIRST HALF, 1940			FIRST HALF, 1941			
	Long Tons	Per Cent Bolivian Production	Long Tons	Per Cent Bolivian Production	Increase, Long Tons	Increase, Per Cent
Patiño.....	7,218	44.6	10,427	48.7	3,209	44.5
Hochschild.....	4,011	24.8	5,394	25.1	1,383	34.5
Aramayo.....	1,452	9.0	1,477	6.9	25	1.7
Other Miners.....	3,500	21.6	4,126	19.3	626	17.9
Total.....	16,181	100.0	21,424	100.0	5,243	32.4 (average)

A glance reveals that the "big 3"—Patiño, Hochschild and Aramayo—are digging out most of Bolivia's tin now. Obviously, the U. S. has to depend largely on them for prompt production in the immediate future. But officials say these big companies are close to their peak, that the smaller companies ("medium" and "small") could greatly expand present output. In fact, predicts the Director General of Mines, with proper development of smaller companies, Bolivia should be able to produce an unprecedented 70,000 metric tons a year for the Democracies! That figure certainly won't happen tomorrow. But the small fellows should certainly be given a chance to show their stuff.

To add point, note the quality of output by different sized producers:

#### QUALITY OF CONCENTRATES

(Figures, same source as above, 1940)

	Over 50 Per Cent Pure Tin, Per Cent *	Under 20 Per Cent Pure Tin, Per Cent *
Patiño.....	98.5	0
Hochschild.....	72.4	7
Aramayo.....	84.0	0
Other Miners.....	63.0	13.35

\* Refers to per cent of year's output.

It is seen that the highest quality comes from the giant Patiño company with its modern plant equipment and scientific direction. Also, it is not quite so good for the other two companies of the "big 3," who are less mechanized and somewhat inferior in plant. The little fellows—with their hand methods, crude

equipment, slight technical knowledge—yield the poorest concentrates.

In this connection, mention should be made of a Bolivian "gripe" about the U. S. in the past: "Trouble is," explains her Director General of Mines, "when North

Americans come to investigate our mining, they usually forget about all of our miners except the three big ones—Patiño, Hochschild and Aramayo!" Substance of the Director General's remarks: Big producers already possess more complete figures, do more research, hence need outside help least of all. The expansion future is in the little fellows—they should get the study and help.

Now then, what's the set-up for helping Bolivia supply the U. S. better? Metals Reserve Co. already has an American miner as its special representative in Bolivia—H. I. Altshuler. In addition, says the State Department, two American mining experts were lately sent to study plans for quick boosting of mineral production and quality. *Small miners* are to get special study, with improvements in their methods and equipment contemplated. And by the time this is read, a loan for Bolivia being considered in Washington last summer may have gone through. Bolivian newspapers blazed with excitement at the prospect of U. S. aid, and variously reported \$20,000,000 to \$80,000,000 might be coming to help out. The credits were planned for: (1) mineral development, (2) roads, (3) defense, (4) money stabilization, (5) agricultural development.

Another point. Why doesn't Patiño Mines & Enterprises Consolidated ship to the United States? Why isn't this biggest mining company of Bolivia, a Delaware corporation, in on the Metals Reserve deal? The general manager says that, "previous British contracts prevent." Moreover, it must be re-

membered that the British also need tin; but if "something happens in England," say officials, the company would certainly ship to us, and might even build another smelter here. Then all Bolivia's tin, in one mighty stream, would be pouring into the United States.

That stream (about 44,000 long tons in 1941) may rise up and up towards the 74,000-ton mark (1940 U. S. consumption), particularly if metal prices mount. But with rising Bolivian production, the U. S. consumption tends upward. The present conclusion must be, obviously: Bolivia's current output can't fully satisfy the current U. S. appetite.

But there are at least two further considerations in weighing Bolivia's production against U. S. consumption.

First, reserves. For months this country has been stacking up a huge strategic tin reserve. By year's end, 1940, according to figures of the Tin Producers' Association, London, Metals Reserve Co. had piled up 38,844 long tons. And in 1941, says another source, 4000 to 5000 tons a month more than the U. S. consumed had been coming into the United States. By December 1941, when the U. S. went to war with Japan, the country must have had tremendous stocks in reserve. Perhaps 90,000 long tons?

Second, conservation. For example, fewer tinfoil wrappers after this. Less tin for non-vital uses, with war manufacturers coming first. In both fields, substitute other more available materials where possible. WPB has announced conservation measures to cut tin use by 15 to 20 per cent.

So all this means—if the usual tons of Far East tin can't get past Axis submarines—that this country will have to (1) *follow through on preliminary efforts to spur Bolivian production*, by technical help, loans, machinery, etc., (2) cut down on consumption, (3) fall back on tin reserves.

It is necessary to add an important word about Bolivia herself. For a closer-knit, healthier Hemisphere when the war is over, the U. S. must pay more and more economic attention to Latin America. In Bolivia's case, this country should do what it can to help make Bolivia's lopsided economy better balanced. One of her aims ought to



be increased production and export of other minerals besides tin. If the combined value of her copper, gold, tungsten, antimony, lead and zinc exports could equal the value of her tin export, the nation would have a few more economic legs to stand on. When today's hungry demand for tin dulls, Bolivia may suffer severely because of her one-track production. Diversification would cushion such blows.

Some temporary help comes in the form of a second contract with the Metals Reserve Co. From last July 1, the U. S. is buying Bolivia's

entire tungsten output—up to 13,200 short tons over a three-year period. Used in special steels, tungsten is a vital metal in wartime, and Bolivia becomes an important supply region to augment or replace endangered Far East supplies. She could furnish half U. S. needs, it is reported. Japan bid against the U. S. for Bolivia's tungsten, offering \$23 per long ton. The U. S. price of some \$21 per short ton won out because the Japanese couldn't guarantee ocean transport in case of war, and Bolivians thought the U. S. pay surer.

Bolivian tungsten production came to a complete standstill after World War I. To avoid repetition of such a hardship after this war, new markets and/or cheaper production methods must be found. Plans were under way last summer whereby the Massachusetts Institute of Technology was to start a research hunt to find new uses for Bolivia's tungsten. If new outlets for the metal result, her tungsten miners may be able to produce for peace as well as war. This is just a minor example of how the U. S. might bolster its Good Neighbor.

## Casting Racks Speed Production

**A**N improved method of handling and storing turbine castings, making use of pallet handling racks, has relieved yard storage shortages and facilitated classification and delivery of castings to the shops at the Lynn River Works of General Electric Co. Incoming materials are classified, placed on pallets for unit operations in the shop,

and then stored in the racks until required by the production department. Delivery of materials to the shops from the racks is made by a fork truck.

This system not only reduced handling costs, but also eliminated the possibility of loss from mislaid materials. Operations are not hin-

dered by inclement weather, inventories are simplified, and the set-up of the racks can be rearranged without disturbing the materials of stock inventories on the racks. The system is particularly advantageous at the present time when expansion of manufacturing facilities places a great premium on yard space.



**B**EFORE installation of racks, castings were stored in the yard, exposed to weather and required considerable space. Pallet handling racks, installed in the storage yards (below), facilitate classification and delivery of the castings to the shop, and at the same time save yard space.



# Plating Alloys

...With a discussion of the plating technique and applications of black and gray nickel deposits, the author concludes this series of articles on plating alloys.

By C. B. F. YOUNG

Electroplating Consultant, New York

LIKE the black molybdenum coating, discussed in the first article in this series, black and gray nickel platings cannot, in the true sense of the word, be called alloys. They are classified as such, however, because they contain, among other elements, nickel and zinc.

Black nickel plating is one of the "old timers," as it has been used for many years as a jet black finish. It can be plated on nickel, zinc, brass, copper and aluminum without any difficulty. Steel can be finished with black nickel if it is first plated with zinc or nickel and then with the black nickel. Any metal that can be plated with nickel, brass, copper or zinc, can likewise be finished with this material. Direct plating of aluminum, particularly notable, is used for contrast effects in metal signs, as shown in Fig. 7. These signs have a black nickel background and raised aluminum letters.

Black nickel does not protect iron and steel against corrosion. If such protection is desirable, the base metal should first be plated with a heavy coating of nickel or zinc.

Since black nickel plating is a very old and well tried process, very little recent research has been conducted on this process. The attitude has long been that black nickel can be taken "as is" because it has proved itself in the past. Within the

last 30 years, it is doubtful whether 10 scientific papers have been published on the subject, and very little is known of the behavior of the plating bath, an interesting subject for original research.

There are several objections to the black nickel coating, some of which are: (1) The adhesion is poor when the base metal is distorted; (2) black nickel is soft; (3) uniform results are difficult to obtain, especially in small baths; (4) a complex problem is presented by the type of anode used; (5) small currents must be used, and (6) the coating weathers when exposed to the atmosphere. Some of

these objections may be overcome, and it is believed that future research will accomplish this.

There have been many so-called black nickel baths. In this discussion, however, black nickel coating denotes a black deposit produced electrochemically by a solution of a nickel and a zinc salt and sodium thiocyanate with the pH of the bath below seven. Composition of the bath has been varied greatly in the course of time, and thus, one formula specifies sodium arsenite in a basic solution of sodium cyanide and nickel sulfate. In many instances a black deposit has been obtained consisting of almost pure arsenic, when no nickel present. Many of the old plating formulas called for an acid and a base in the same bath. Such a hodge-podge of materials could only produce a mixture, is wasteful and often gives undesirable results. Also, many of these old formulas produce insoluble compounds that form a heavy precipitate at the bottom of the tank, wasting valuable chemicals. Satisfactory baths are shown in Table VIII, along with bath conditions. Bath A produces a harder plating than Bath B.

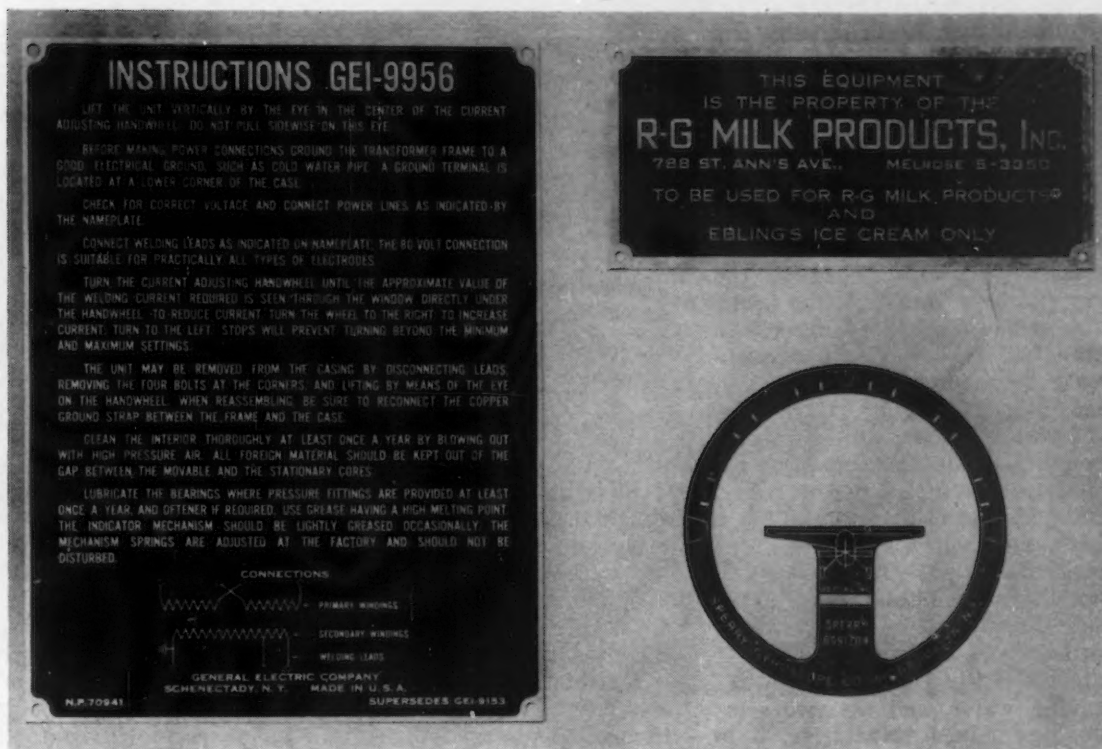
Black nickel can be produced as a heavy black deposit when a low current density is used in a properly balanced solution. The deposit plates very rapidly, more rapidly

TABLE VIII  
Black Nickel Plating Baths

BATH COMPOSITION	Bath A	Bath B
	Oz. Per Gal.	Oz. Per Gal.
Nickel sulfate, $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$	10	..
Nickel ammonium sulfate, $\text{NiSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$	6	8
Zinc sulfate, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$	5	1
Sodium thiocyanate, NaCNS	2	2
BATH CONDITIONS		
Current density	1.5 to 2 amp. per sq. ft.	
Voltage	0.75 to 1.5	
pH	6.5 to 6.7	
Temperature, deg. F.	68 to 77	
Anodes	75 per cent carbon, 25 per cent nickel	



**FIG. 7—** These Aluminum sheets have a black nickel background, and the lettering is raised on the base metal. This produces a contrasting effect and is especially suitable for signwork and dials.



in fact, than predicted by Faraday's Laws. Thus, it is possible to coat some metals within a few minutes. Black nickel, having a variety of uses as backgrounds for dials and signs and for producing antique effects, is easily finished after plating. Highlights are relieved by scratch brushing or other similar methods of removing a portion of the coating and leaving the remainder a dull black. This is done frequently with Sterling silver flatware to produce an old silver appearance.

Since black nickel is soft and cracks readily when the base metal is deformed, the use of this deposit entails special handling. Likewise, control of the bath, often essential, is another difficulty, but this may be overcome if the bath is chemically controlled and operated under correct conditions.

If the current density is increased beyond that indicated in Table VIII a streaky, gray deposit will result. This results from the excessively high pH generated in the cathode area, which, in turn, precipitates on the surface of the cathode basic salts of zinc and nickel. If the concentration of the zinc or thiocyanate becomes too low, the deposit or plating will be a gun metal color instead of jet black.

The composition of the deposit

obtained from the baths in Table VII will be:\*

Nickel .....	50 per cent
Zinc .....	7 per cent
Sulphur .....	15 per cent
Organic matter...	Remainder

\*U. S. Bureau of Standards Technical Paper, No. 100.

Often a gray nickel coating is desired for illustrative and con-

trast purposes. It is possible to obtain such a deposit from the baths shown in Table VIII by using a higher current density and voltage, and by decreasing the pH to about six. However, this is rather difficult to regulate at times and a more suitable bath for gray nickel coatings is shown in Table IX.

Sodium thiocyanate is not essential to the bath. It has been chosen

**FIG. 8—** An Ordinary yellow brass strip was plated with bright nickel, then plated for five min. with gray nickel and then buffed, producing the finish illustrated here.



by Haast† that Rochelle salts and sodium sulfate can be substituted for the thiocyanate, and black deposits can be produced.

†*Metal Industry*, 19, 1921, pp. 23 to 73.

### Special Bath

It has been stated already that research is badly needed in the gray and black nickel plating fields, but now and then something new is developed. However, such developments are generally kept secret and used in specified fields. It was the good fortune of the author to come upon a formula that produces attractive gray nickel deposits that can be applied to a variety of uses. This bath is shown in Table X.

Ingredients are numbered to facilitate mixing this bath. Ingredient No. 1 is dissolved in two-thirds of the required amount of water; No. 2 is dissolved in the remaining water, and the two solutions are mixed. Next, No. 3 is added to the bath and when it is dissolved, ingredient No. 4 is placed into the solution.

TABLE IX  
Gray Nickel Plating Bath

BATH COMPOSITION	Oz. Per Gal.
Nickel ammonium sulfate, $\text{NiSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ .....	8
Sodium thiocyanate, NaCNS .....	2
BATH CONDITIONS	
Current density .....	1.5 to 2 amp. per sq. ft.
Voltage .....	0.75 to 1.5
pH .....	6-6
Temperature, deg. F. .....	68 to 77
Anodes .....	Nickel

TABLE X  
Gray Nickel

BATH COMPOSITION	Oz. Per Gal.	Gm. Per L.
(1) Sodium pyrophosphate, $\text{Na}_2\text{P}_2\text{O}_7 \cdot 10\text{H}_2\text{O}$ .....	20	150
(2) Nickel sulfate, $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$ (CP) .....	2 2/3	20
(3) Aluminum ammonium sul- fate, $\text{AlNH}_4(\text{SO}_4)_2$ .....	2	15
(4) Potassium cyanide, KCN .....	1	7

In a bath of this nature, it is essential that the nickel anode have a low anode efficiency. Otherwise, the nickel content of the bath will increase and produce an unbalanced solution. To prevent a nickel increase in a small bath, nickel wire from 1/16 to 1/8 in. in diameter can be inserted into the solution to a depth of 1/4 to 1/2 in. This causes polarization of the anode and a decreased anode efficiency because of the high anode current

density. In a large bath, carbon anodes can be substituted for some of the nickel anodes, as suggested in the black nickel baths shown in Table VIII.

As has been pointed out, research is badly in the field of black and gray nickel plating, and it is believed that such experimental work will be forthcoming shortly, because industry demands a good black coating and is willing to pay for it.

## Silver as a Substitute for Scarce Metals

THE use of silver in powdered metallurgy is increasing, it being employed for making mechanical mixtures containing metals, such as nickel, which do not alloy with silver except in small proportions. Graphite, tantalum, molybdenum and tungsten are among the materials mixed in finely powdered form with silver powder, compressed and sintered at a temperature slightly below the melting point of silver.

Some resulting products can be rolled into sheet or drawn into rod which now are used chiefly for making electrical contacts and welding electrodes, although other applications are contemplated. Wire suitable for heading operations is produced, since silver itself is ductile and helps to form ductile mixtures. It is possible to make mixtures almost as dense as might be expected if complete alloying were possible. On the other hand, if an ingredient which can be volatilized after pressing has been done is added, a uniformly porous product can be produced.

With copper production barely able to keep pace with defense needs, the use of silver in bus bars has been suggested and has more than academic interest. If Govern-

ment-owned power plants or private companies replaced copper bus bars with those made of silver, thousands of tons of high-purity copper could be released for defense applications. The silver presumably would come from reserves now idle in Government vaults or from newly mined metal which the Government is constantly purchasing from domestic producers. It might be lent and returned later when needs for copper are less pressing.

Silver, while being the best electrical conductor known, also has other excellent physical properties suiting it for use in bus bars. It is easily fabricated and can be silver-soldered or brazed with silver alloys in the same way that copper bus bars are brazed.

Another use of silver is in the manufacture of bearings for radial air-cooled and liquid-cooled aircraft engines, replacing babbitt, according to information recently released by the American Silver Producers' Research Project. Some of the bearings are complete rings coated inside and outside with silver, and some are split and coated on the inside surface only. Silver is understood to be capable of carrying higher loads than babbitt, is a better conductor of heat, and retains

its hardness at temperatures above those feasible with babbitt.

As far as is known, the coatings are applied by electroplating, although it is possible that other methods of application have been found suitable. Subsequent to application, the silver may be machined to hold the close limits on dimensions required in aircraft work. Silver removed in machining and that applied on bearings which are damaged in process or may be rejected for minor defects is easily reclaimed. All silver coatings on bearings in service are believed to be pure silver, which has high corrosion resistance and is not attacked by corrosive agents sometimes found in lubricating oils. In this respect, the bearings are quite different from cadmium alloyed bearings with small proportions of silver, and should not be confused with such alloys.

Although the silver coatings applied to bearings are about as thick as those of babbitt previously used, most silver coatings applied to metals for industrial and other uses are well under 0.001 in. thick and are low in cost because the quantity of silver used is small and is readily applied by plating and other means.





### METAL POWDERS

have opened up an entirely new field of metallurgy and are being increasingly exploited by a commercial industry that each day encounters new demands for its products. Particularly interesting is iron powder, which can have various origins, i.e., from sponge iron, reduced from iron carbonyl, converted from scrap steel, etc. At Moraine Products Division of G.M., Dayton, large tonnages of iron and steel scrap (above, right) are converted into iron powder (above, left).

**A**T Moraine, low carbon steel scrap is treated by various processes and then broken up in a ball mill, after which it is run through a belt-type controlled atmosphere decarburizing furnace. The result is a high purity iron powder, very soft and uniform in quality and size of particles. Air classification has been tried, but so far satisfactory commercial equipment is not available. All the iron powder is passed through 150 mesh screen, with 50 per cent of the material passing through 325 mesh screen. The graphite added is ultra fine. Copper powder is passed through 150 mesh screen, with 60 per cent passing through 325 mesh screen. Bronze powder is made up of 9 parts copper, 10 parts tin, and 2 parts graphite, all by weight. The graphite is added to the bronze to help lubrication in bearings made from the powder. The bronze powder is mixed in more elaborate equipment than that shown below for iron powder, the mixing involving a certain amount of aeration, etc.

• • •

**T**HIS mixer is used to blend coarse and fine iron powders, and to mix graphite with the iron powder. The mixer is loaded from the top, and the mixed powder comes from the center chute. The 2 per cent graphite generally added serves to supply carbon for subsequent sintering and also lubricates the dies during briquetting.

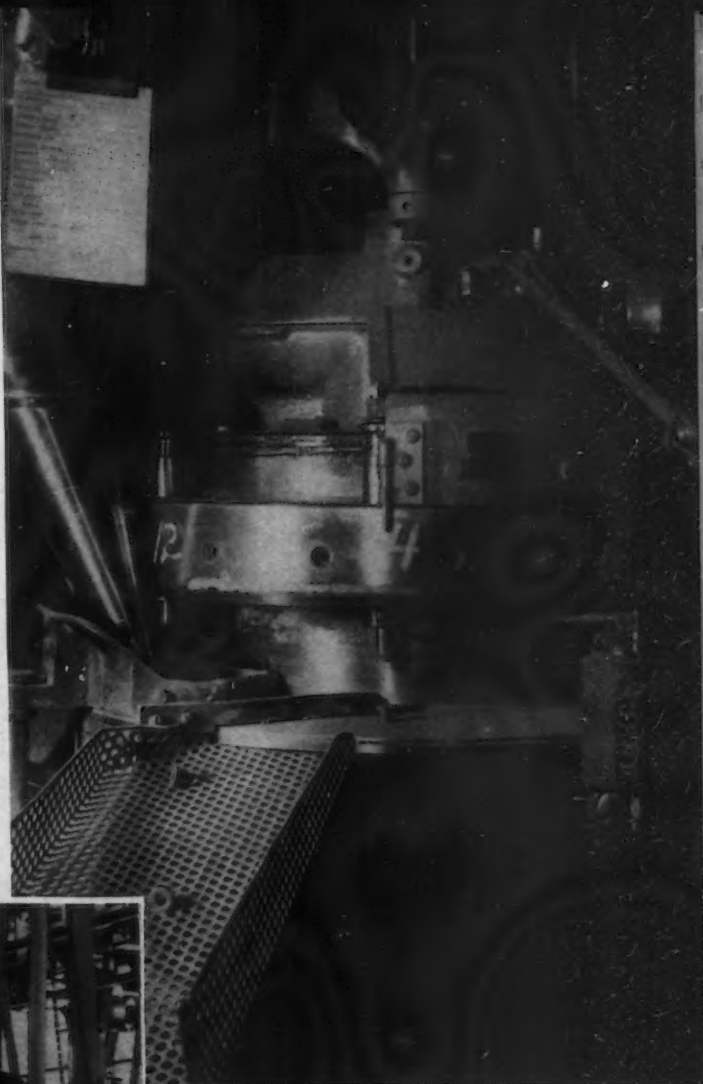
• • •



**H**ERE is just part of the large stock of dies at Moraine. Die material and treatment varies with whether iron or bronze powders are to be worked. The dies are usually made of oil hardening steel, with clearance of 0.0005 in. Close control of clearance is particularly important in order to secure uniform and high quality products.



THE basic operation in powder metallurgy is briquetting. This small rotary briquetting machine (a pill-making machine with little alteration) normally carries 16 dies, but is operating here (right) on 4 dies. A small bronze door hinge bearing is being made—one has just been ejected and one is rolling down the chute. Using all 16 dies a production of 130 per min. is usually obtained. Briquetting pressure is about 30,000 lb. per sq. in. A stationary hopper of powder is to the left, and the die cavity rotates under it.



HERE is a whole row of small automatic machines briquetting various articles, as for instance an auto water pump bearing, a thrust washer for a washing machine, electric motor bearings, etc. The bronze powder for these products is frequently 90 Cu, 10 Sn, and 2 per cent graphite. Speed on these machines is about 300 per hr. and varies with size and shape.

THIS large bearing is being briquetted from iron powder. This machine also is automatic, and pressures run 60,000 lb. per sq. in. Parts such as these are made in competition with conventional machined parts, and large numbers and automatic machines make such competition possible. Hopper and sleeve full of powder, to the left, move over the die cavity to push aside the bearing and to fill the cavity.





**A**NOTHER briquetting operation. Here large bronze bearings are being turned out on an automatic machine. These bearings can have various amounts of porosity, depending primarily on the briquetting pressure. Also, they are generally impregnated with oil as a final operation, to provide self lubrication.

o o o

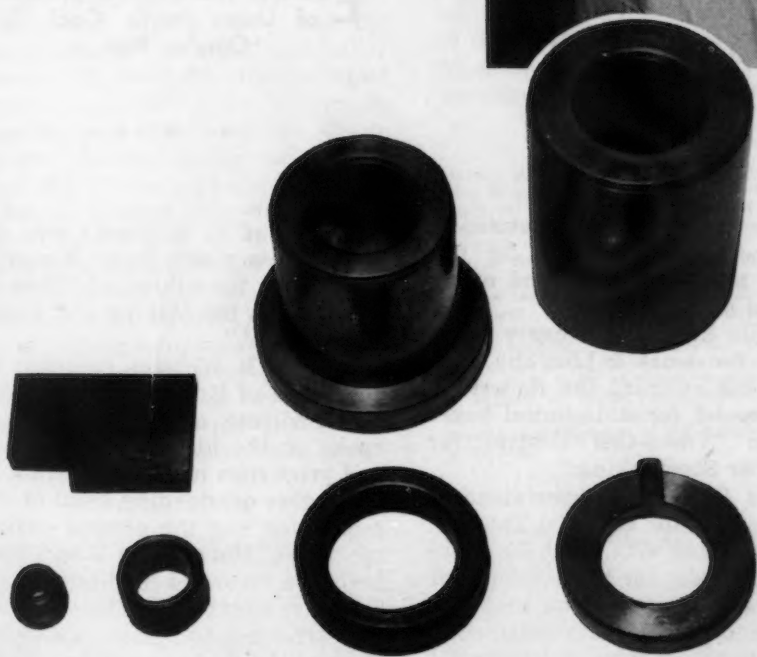
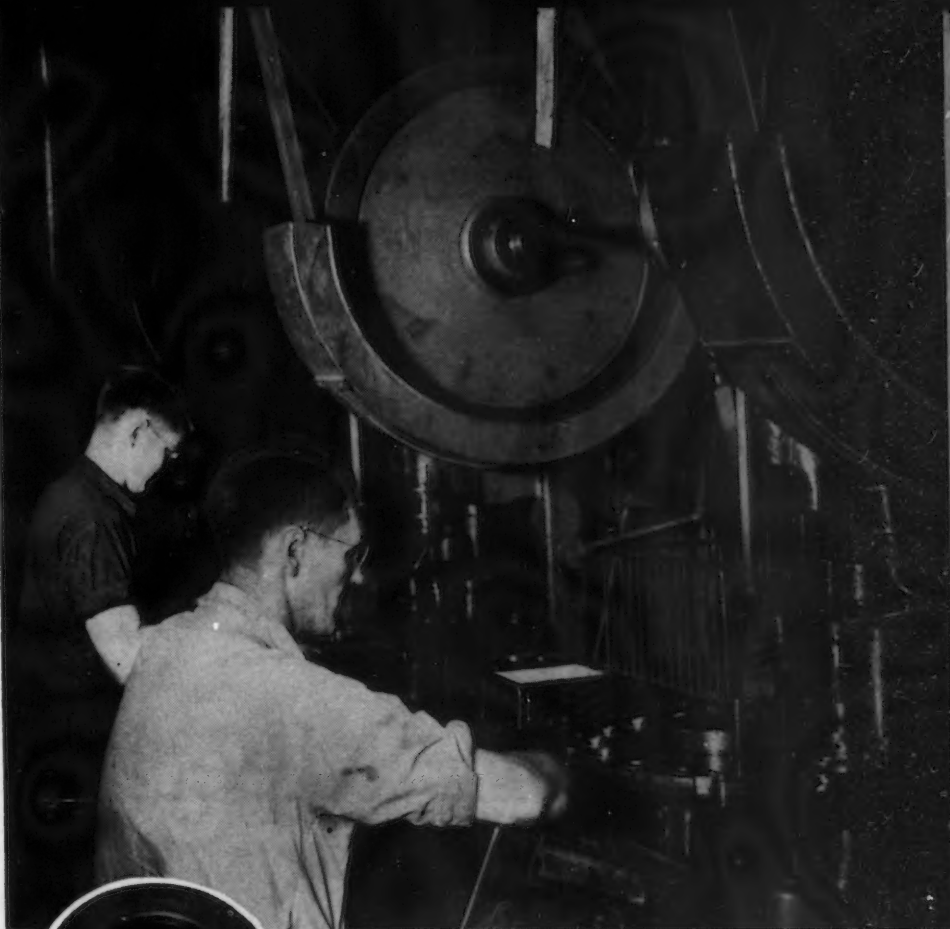
**A**N experimental or short-run operation (below). Weighed quantities of powder are in the cups. One cup is emptied in the die cavity, the male die member is inserted and the assembly put under a press for briquetting



**G**REEN briquettes must be sintered (left). For bronze a gas furnace is used at about 1500-1600 deg. F., with a water jacket on the cooling end. Travel through the furnace is about 35 min. For iron an electric furnace is used, temperature being about 2050 deg. F. A controlled atmosphere is used in both types and is necessary in order to sinter since oxides prevent good bonding of the powder particles.



SOME change in size occurs during sintering, and for this reason many powder products are subsequently sized in die machines such as these (right). The operators place the sintered articles in the die cavities, which revolve under the sizing die and are automatically ejected, providing a lightly burnished part held to close tolerances.



SOME typical bronze and iron powder products. At the top are two auto water pump bearings; below is a thrust washer for washing machines and an (iron) collar used in automobiles; the two small bearings to the lower left are for electric motors; and the flat article is an iron oil pump vane.

THESE are Durex iron radio tuning brake shoes. High hardness, low cost and close tolerances are the chief requirements in this application. A tolerance of 0.0015 in. is maintained between end projections during production. Durex iron is porous and contains about 1 per cent combined carbon as well as a small amount of free graphite.



# Metals and War

## Theme of

### AIME Meeting

New AIME President



**EUGENE** McAULIFFE, president of Union Pacific Coal Co., Omaha, Neb.

o o o

**O**RES, metals and the war were the chief topics of discussion by the some 2000 members of the American Institute of Mining and Metallurgical Engineers who attended the institute's annual convention in New York last week. The technical papers presented at the meeting were tuned to the new war conditions and were chiefly concerned with ways and means of boosting output of strategic minerals.

New officers for 1942 were installed during the convention, with Eugene McAuliffe, president of Union Pacific Coal Co., Omaha, Neb., taking over the presidency of the institute.

Earle Smith of Republic Steel Corp., new chairman of the Iron and Steel Division, also took office, as did Carl Swartz of Cleveland Graphite Bronze Co., the new chairman of the Institute of Metals.

One of the outstanding events of the meeting was the annual presentation of medals for meritorious contributions to the industry.

To Arthur S. Dwight, president of Dwight & Lloyd Metallurgical Co., New York, was awarded the James Douglas Medal for his contributions to the art of smelting nonferrous ores, and particularly

for his pioneer work in developing equipment and technique for sintering nonferrous ores and metallurgical products.

Harold K. Work, manager of research for Jones & Laughlin Steel Corp. was awarded the Robert W. Hunt medal for a technical paper entitled "Photo-Cell Control for Bessemer Steelmaking."

Louis F. Sattelle, superintendent of pipe mills for National Tube Co. was presented with the J. E. Johnson, Jr., medal for his development and practical application in blast-furnace operation of fundamental slag data as described in a technical paper prepared by Mr. Sattelle entitled "Effect of Magnesia and Low Alumina in Blast Furnace Slags on Furnace Operation and Desulphurization."

This year's Institute of Metals award was presented to F. N. Rhines of the Carnegie Institute of Technology for his paper "A Metallographic Study of Internal Oxidation in the Alpha Solid Solutions of Copper."

The two annual lectures, the Howe Memorial Lecture and the Institute of Metals Lecture, were fully up to the high standards set by lecturers of previous years.

Dr. John Johnston, director of

Research of U. S. Steel Corp., delivered this year's Howe Memorial Lecture on the subject of "Time as a Factor in the Making and Treating of Steel."

William R. Webster, chairman of the board of Bridgeport Brass Co., the Institute of Metals lecturer, spoke on the history, manufacture and properties of wrought brass.

Another outstanding event of the convention was the general session on "Ores, Metals and War," held before a crowded auditorium on Tuesday afternoon. This meeting was arranged to bring authorities from both industry and government before the engineers and to discuss with them the steps which have been taken to expedite mineral output and to ask suggestions as to what other steps could be taken.

W. Sykes, president of Inland Steel Co., served as chairman of the meeting, and, in the absence of R. C. Allen of the WPB, who was unable to attend, spoke on "Controlling Factors in Iron and Steel." Clyde Williams of the Battelle Memorial Institute acted as moderator of the meeting.

In addition to Mr. Sykes and Mr. Williams, the following also spoke at the meeting: R. E. McConnell of WPB, Z. Jeffries of the National



Academy of Sciences, D. H. Wallace of OPA, John A. Church copper and zinc consultant of WPB, A. Leith of WPB, and P. D. Wilson of WPB. Following the presentation of the formal addresses, the speakers and other authorities endeavored to answer questions from the floor.

Mr. McConnell's remarks stressed the need for more trained engineers to keep pace with the expansion of war industries. The shortage of engineers was termed by the WPB expert as the most serious shortage facing this country. As an illustration of the degree of mechanization of modern warfare, Mr. McConnell pointed out that in the first World War seven men were required behind the lines to keep one man supplied in the front lines. In the present war, he said, it is estimated that it requires an average of 17 men behind the lines for each man on the firing line.

An interesting remark of Mr. Sykes' was to the effect that the unprecedented demand for alloy steels will inevitably force simpler compositions as a means of increasing output with available equipment. Discussing the scrap problem, Mr. Sykes said his belief was that the present year would be the most critical one. If the nation is able to squeeze through 1942 without important loss of steel due to lack of scrap, it will be an important accomplishment. He foresaw an easing of the scrap situation in 1943 as new pig iron capacity came into operation, with the picture probably balancing by 1944.

The growing interest in the bessemer process was reflected in the evidence of continued energetic probing into the technology of bessemer steel making. In the course of the Howe Memorial Lecture, delivered by Dr. John Johnston of U. S. Steel Corp., it was pointed out that bessemer steel has been regarded as inferior to open hearth material largely due to the belief that this steel was less uniform from batch to batch than open hearth steel, and that this lack of uniformity has been mainly due to an overemphasis on finishing each batch in the shortest time possible, with the consequent impracticability of stopping each blow at precisely the proper endpoint.

To obtain a reproducible indication of an endpoint is, Dr. Johnston said, not the whole story, for, as is well known, the relative rate of oxidation of the several elements changes with the temperature of the metal. The final composition of the metal leaving the converter depends, therefore, upon the temperature of the metal throughout

the process, as well as upon the chosen endpoint.

Within the past four years these questions have received more attention than during the preceding half century, with the result that instruments and methods are being developed which will enable the bessemer operator to furnish a more uniform product. The number of tons of ingots which he produces each hour may be less, but the number of tons of acceptable product may be expected to increase with a consequent increase in the proportion of bessemer output to open hearth output.

Additional consideration of this end point problem was given in a paper presented by H. T. Bowman of the Aliquippa Works of Jones & Laughlin Steel Corp., entitled "Significance of the Bessemer End Point."

This paper was concerned with the degree of oxidation and its effect on steel quality, and the author's studies indicated that the degree of metal oxidation is dependent upon carbon content until the low carbon values are reached. The paper also showed that the length of the silicon oxidation period reflects accurately the silicon content of the iron being blown.

The paper also indicated that an increase in the temperature of blown metal increases the solubility of iron oxide with a corresponding decrease in recovery of manganese. It was also brought out that when operating variables were constant, the length of afterblow

o o o

**METALS AND THE WAR**—This outstanding gathering of authorities on metals participated in the forum on "Ores, Metals and War" sponsored by the AIME at its annual convention. Reading from left to right these experts are: Enoch Perkins of the National Academy of Sciences; Z. Jeffries of the National Academy of Sciences; Andrew Leith, technical consultant of WPB; John A. Church, WPB consultant on copper and zinc; P. D. Wilson, WPB consultant on magnesium; D. H. Wallace, assistant director of the price division of OPA; P. Linz, mineral authority of OPA; H. D. Smith of Metals Reserve Corp.; C. F. Jackson of United States Bureau of Mines; G. W. Roddewig, OPA zinc and cadmium unit head, and Gilbert Seil of the National Academy of Sciences.



determined the degree of metal oxidation.

Discussing the effect of temperature variation on the degree of oxidation, Mr. Bowman described a study of two consecutive blows given the same length of afterblow, but blown at different temperatures. While the temperature variations were similar to those encountered normally, they were sufficient to cause a sharp difference in the degree of oxidation as well as the manganese efficiency.

Mr. Bowman also presented a series of charts which indicated that the length of the afterblow had a definite effect on the manganese efficiency. The trend of this efficiency generally moves downward from around 70 per cent with a young blow, to a little below 40 per cent at 20 seconds.

Mr. Bowman's comments on mechanically capped bessemer ingots were also of interest. Pouring practice in such molds, he said, requires a rising or growing steel, controlled within narrow limits. This, of course, requires that the metal temperature and degree of oxidation be closely controlled as a variance of oxidation may cause a difference in the quality of two blows, but such variations often can cause non-uniformity within the individual blow.

In the early days of the photocell investigation, many blows were followed to evaluate the different blowing practices, and it was discovered that overoxidation or underoxidation usually caused poor surface or unsound internal structure, or both. The evidence of such an investigation is overwhelmingly against anything over a 17-sec. afterblow, and it is rather definite that the young blow can be expected to give surface trouble.

While not as important from the tonnage angle as capped steel, rimmed bessemer is important as a source of material when ductility and surface are required, rather than cross-sectional uniformity. In blowing steel for rimming ingots, according to Mr. Bowman, the end point control is the reverse of that for capped practice in that in the latter overblowing is critical, but for good rimming practice, underoxidation is to be avoided.

However, on the other hand, overblowing is also to be avoided because it causes excess segregation, greater metal loss, lower manganese efficiency and, sometimes, impaired surface.

The young, underoxidized heat contains insufficient dissolved FeO to promote good rimming action, giving rising ingots. In the lower portion of the ingot the pressure of the evolved gas is too low to force itself up through the metal. These trapped gases form blowholes immediately beneath the ingot surface and cause the ingot to grow. Subsequent heating in the soaking pits is very likely to scale off the primary ingot surface, exposing the blowholes to oxidation, which in turn causes substandard surface quality.

Mr. Bowman illustrated surface defects, plotted against length of afterblow on five consecutive rimmed heats that were followed closely from iron to billet hot bed. Surface defects were prevalent on the billets from the bottom half of every ingot on this blow, while very few defects appeared on the upper billets. On the other hand, the defects that appeared on the severely overblown heat (26-sec. afterblow) were confined mostly to the first and last ingots, indicating that a controlled rate of gas evolution was attained throughout most of the pour.

From preliminary data now at hand it seems that a minimum of 0.28 to 0.30 per cent dissolved FeO in the ladle is necessary to promote good rimming action. Very limited data indicate that ladle FeO values above 0.35 to 0.37 per cent, while they give a very nice rimming action, cause excessive segregation in the top portion of the ingot.

Although well known, the effect of temperature on rimming action should be discussed, the author said. A cold heat often rims poorly, even though it contains enough FeO to promote the rimming action. Cold heats where the ladle FeO content was as high as 0.29 per cent have given poor rimming action and substandard billet surface.

On hot heats the excessive temperature delays the formation of the chill crystals that start the inward freezing of the metal. Gas evolution proceeds without metal solidification, and should this condition last long enough before the metal begins to rim in there will be insufficient gas left to maintain the proper action and the ingot will grow, much the same as the ingots of a young heat grow.

End-point control is subject to considerable variation in the manufacture of bessemer screw steel.



**C**ARL SWARTZ of Cleveland Graphite Bronze Co., new chairman of the Institute of Metals Division, A.I.M.E.

One contention, held for years, is that oxysulphides are the sources of machinability. Overblowing, with increased contact between iron oxide and sulphur, should promote the formation of these sulphides. The degree to which this path may be followed is limited only by the amount of billet reconditioning that will be countenanced by plant management, for, generally speaking, the more the overblowing, the greater the reconditioning costs, according to Bowman.

Machining of the center piercing or drilling type is often retarded by such overblowing because of the excessive segregation that accompanies this blowing practice. An elaborate etch testing program developed this information in a striking manner, which led to the adoption of the afterblow length that gave the soundest internal structure. This is in the neighborhood of 15 to 16 sec. under normal blowing conditions. Surface quality is enhanced also by this length of afterblow.

Sulphur additions to the vessel change the appearance of the flame during the flame drop and also lower the recorded end point on the electric-eye chart, Bowman pointed out. The flame appears more red and gives off large quantities of red-brown fumes. This causes the heat to look overblown before the end point is actually reached and in many plants where all the sul-





**E**ARLE C. SMITH of Republic Steel Corp., new chairman of Iron and Steel Division, A.I.M.E.

phur is added to the vessel, the blow is turned down during the flame drop.

While the tonnage of killed and recarburized bessemer is relatively small, enough has been produced to show that the overblow should be avoided. In low-carbon killed steel the blow should be turned down at the end point, assuring the carbon desired, but avoiding excessive oxidation. The general practice with recarburized steel is to pull the heat as soon as the flame drop is definitely reached, according to Mr. Bowman.

Bessemer slag is dry and coarse in appearance at any point of turn-down before the flame drop. At the end point there is sufficient FeO contained in the slag to hold it together as a dry, pasty mass. With an extension of the afterblow, the slag takes on a wet, mushy appearance, and with severe overblowing the tendency of the slag to run into the ladle is difficult to overcome.

The slag analysis, Mr. Bowman said, is a good indication of the degree to which the blow itself has been oxidized. Comparatively little iron is lost in the slag in any blowing practice that terminates the blow before the end point is reached, while an appreciable amount of iron is contained in slag of an overblown heat.

In view of the growing interest in the conservation of metals, considerable interest was indicated in

the paper "Simplified Electrostatic Separation," by G. W. Jarman, Jr., president of Separations Engineering Corp., and W. Byrd, Jr., consulting engineer. The paper reviewed developments which have taken place lately in the technology of electrostatic separation and described how these improvements have reduced the cost of such processes until they were down to the point where it was economically possible for small plants to utilize them. Among the present uses for such separation equipment listed by the authors are the separation of scheelite from pyrite, rutile from zircon, silicon carbide from aluminous abrasives and stainless steel grindings from abrasives.

Discussing the cost of such separation equipment, the authors pointed out that supervision and maintenance are similar to that of other roll type machinery. The capital cost per ton of head feed was placed at one-third its former value due to improvements developed recently.

For the purpose of comparison with other forms of separation, and using a five year depreciation, 6000 hr. per year, \$1 an hr. labor, 2c. per kwhr. power, and ample provision for repairs, it was stated that the cost per ton of feed head will vary between 22c. and 58c., depending upon the tonnage handled.

A new technique, using the best combination of feed, roll speed and ion spray discharge, has materially increased capacity and opened the way to simplified electrostatic separation, according to Jarman and Byrd. Costs, it was asserted, have become comparable with those of other special methods, particularly with reference to capital installation costs. Refinements in the process, which include close control of temperature and particle size permit separations previously believed impractical by electrostatic methods.

Tests conducted by the authors brought out the following interesting facts:

(1) Roll diameter, while relative to particle size, is not critical, a 6 in. diameter giving generally satisfactory results.

(2) A single discharge electrode is generally superior to parallel electrodes.

(3) The discharge from a needle type electrode as compared with a fine wire is more diectional and stronger, but less uniform.

(4) Conditioning of the feed as

to dryness and temperature may alter to a considerable degree the relative electrical properties of the minerals to be separated.

(5) Since the Sutton process of electrostatic separation does not require great differences in electrical conductivity to permit a separation, accurate temperature control extends both the range of application and increases efficiency.

The authors also presented data to show the relation between particle size and roll speed, as indicated in the following table:

Particle Size	RPM (6 in roll)
—20 + 28	110-130
—28 + 48	150-190
—48 + 65	200-240
—65 + 150	250-400

Reflecting the deep interest in both theoretical and practical metallurgical problems, the program of the Institute of Metals covered six sessions, with nineteen papers, many of which covered subjects of immediate importance in the defense program.

The first session, on "Physical Metallurgy," gave much attention to theoretical considerations, and opened with a paper entitled "The Constitution of Copper-rich Copper-silicon-manganese Alloys" by Cyril Stanley Smith of the American Brass Company and Walter R. Hibbard, Jr., of Yale University. The authors carried forward some work begun by Mr. Smith in 1929, and presented diagrams showing the range of the kappa and alpha phases of these alloys.

A paper entitled "Some Mechanical Properties of Manganese-Copper Alloys" by Alfred H. Hesse and Edwin T. Myskowski of the Division of Physical Metallurgy, Naval Research Laboratory, Anacostia Station, Washington, D. C., described tests on the tensile strength, elongation, hardness and effect of tempering on volume change, of a group of manganese-copper alloys.

The development by the U. S. Bureau of Mines of a process for purifying manganese has stimulated interest in these alloys, which possess an excellent combination of tensile strength and ductility, and are characterized by high vibration damping capacity. These investigators noted that if the high-manganese alloys are held at temperature too long, their ductility suffers. The fact that these alloys have slow rates of reaction was held to be not inconsistent with the complex structure of alpha manganese

and its low solubility for copper. "Rate of Growth of Intermediate Alloy Layers in Structurally Analogous Systems," a paper by B. Lustman of the Standard Steel Spring Co. and R. F. Mehl of Carnegie Institute of Technology, was a study of the kinetic laws governing the growth of intermediate layers formed in cementation processes. When iron, for example, is zinc-plated, then heated for some hours at a temperature below the melting point of the zinc, there is diffusion across the interface, and layers of alloys are formed.

The authors devised an electrolytic stripping method for determining the thickness of the different phases and the identification of the alloys formed. The following systems were studied: the phase layers appearing in the interaction of Cu, Ni, Ag, and Au with Cd and Zn, and of Co with Zn; also rates of formation of individual phase layers and of total reaction layers have been measured for the systems Cu-Zn and Cu-Cd, Ni-Zn and Ni-Cd, Ag-Zn and Ag-Cd, Monel-Zn and Monel-Cd, and Co-Zn and Fe-Zn. A general parabolic equation, applicable to these reactions, was formulated.

The Wednesday morning session on "Effect of Rolling Copper and Brass" brought out five papers, all containing matters of vital importance to national defense. Lively discussion was inspired by several of the reports, and the large audience participated freely. In "Structure of Copper After Rolling," by Charles S. Barrett and F. W. Steadman, of Carnegie Institute of Technology, reported on investigations designed to contribute to a better understanding of the preferred orientations in rolled copper, as similar studies have for rolled iron and brass.

Particular attention was given to determining orientations that are stable during rolling, and to the manner of fragmentation and rotation of unstable grains. They studied large-grained material, also single crystals mounted in polycrystalline blocks. No evidence of twinning was found.

Another session held by the Institute of Metals Division was concerned with "Structure and Properties of Copper and Brass." Three papers were presented, all describing studies on the effects of certain impurities. In "Magnetic Studies on the Precipitation of Iron in Alpha and Beta Brass," Cyril Stan-

ley Smith of the American Brass Co., Waterbury, Conn., discussed a phenomenon that had been observed as long ago as 1684. The fact that some samples of brass can be made ferromagnetic by hammering, and nonmagnetic by subsequent heating, has long been known, but there was so much apparently contradictory behavior that the explanation was not clear.

The investigator described the procedure, involving heating, cooling or quenching, and subsequent cold-working, by which the small quantity of iron that is present may be precipitated in a magnetic form. The effect is assumed to be associated with the location of the iron atom in the parent lattice.

The paper, "Effect of Impurities on the Solubility of Sulphur Dioxide in Molten Copper" was presented by Carl F. Floe and John Chipman of Massachusetts Institute of Technology. In a previous paper on the solubility of this gas in molten copper, these authors had observed certain discrepancies between their data and the theoretical predictions. It was thought that these might be caused by impurities in the copper.

The present study, therefore, considered the effects of oxygen, sulphur and carbon on the solubility of sulphur dioxide in copper at 1100 deg., 1200 deg. and 1300 deg. C. Their results indicate that the system obeys the simple mass law, and that the discrepancies in previous work resulted from the presence of very small amounts of carbon.

This paper has important bearing on the practical considerations involved in the production of copper and copper-base alloy castings. It throws new light on methods of deoxidation, degasification, the proper furnace atmospheres, etc., for the prevention of porous or "leaky" castings.

In the Institute's Thursday morning session, on "Diffusion," the members were told about some researches in which one of the newest of scientific tools, the radioactive or "tagged" atom, was employed. In "Self-Diffusion of Copper," the authors, Martin S. Maier and H. R. Nelson of the Battelle Memorial Institute, utilized the "tagged" copper atom. They pointed out that the diffusion of metals has been observed in many processes; thus in the carburization of steel the diffusion of two kind of atoms has taken place. Other



**HAROLD K. WORK**, manager of research and development, Jones & Laughlin Steel Corp., winner of the Robert W. Hunt award.

phenomena of equal interest involve the diffusion of like atoms; for instance recrystallization and creep. Very little work has been done on this self-diffusion, or diffusion in which only atoms of the same kind are involved, because up to the discovery of artificial radioactivity in 1934, we had no means of detecting the diffusing atoms except in the elements with naturally radioactive isotopes.

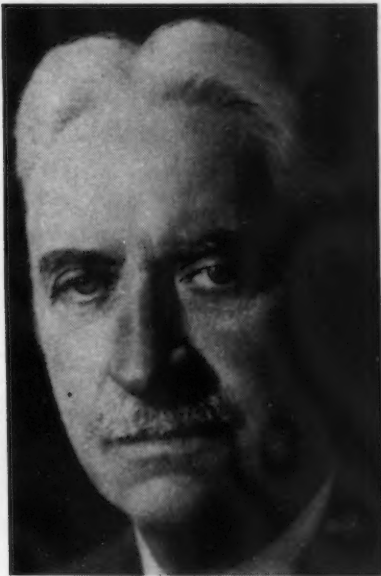
Recently, however, the artificially produced isotopes have been studied, and in this paper the radioactive copper,  $\text{Cu}^{64}$ , prepared by deuteron bombardment of copper in a cyclotron, was used. The radioactive copper was dissolved in acid and deposited electrolytically upon ordinary copper, then the rate of diffusion of the tagged atoms under different temperature was measured. The authors found that this rate was higher in single crystals than in ordinary polycrystalline copper.

Their results, they said, were inconclusive as regards the possible anisotropy of self-diffusion in copper because of erratic results attributed to imperfections in the single crystals. They concluded, however, that if anisotropy of diffusion exists, it must be small and easily masked by effects due to crystal imperfections. They pointed out the several possible sources of





**LOUIS F. SATTELE**, superintendent of pipe mills, National Tube Co., awarded the J. E. Johnson, Jr. medal.



**ARTHUR S. DWIGHT**, president of Dwight & Lloyd Metallurgical Co., New York, awarded the James Douglas medal.

error in their procedure, and intimated the need for further investigation.

In the final session of the Institute of Metals Division, on "Corrosion," three papers were presented on topics whose interest stemmed from our need to supply substitutes for certain strategic metals. "Electrochemical Behavior of the Lead-Tin Couple in Carbonate Solutions" by Gerhard Derge, Harold Markus and Arthur Grobe, all of the Metals Research Laboratory, Carnegie Institute of Technology, described a research undertaken to conserve tin in the manufacture of collapsible tubes, a most important project, under present conditions. Many applications have been developed in the past in which tin was combined with lead, either by coating, as in tin-lined collapsible tubes, or by alloying as interne plate. A detailed knowledge of the corrosion characteristics of the tin-lead couple is therefore of timely interest.

This study was limited to carbonate solutions of a pH range from 8.4 to 11.2 and the results may be related to previous work on the corrosion of tin and its alloys, and the influence of several additions to the carbonate solutions were determined, some of which tend to reduce the corrosion of the lead.

Summarizing, he found that:

(1) In sodium carbonate solution with a pH 11.2 the tin-lead couple is under cathodic control and the anodic elements are tin.

(2) In carbonate solutions with pH values of 10.0 and 9.5 the couple remains under cathodic control and tin remains anodic, but the corroding current becomes increasingly smaller.

(3) In carbonate solutions with a pH of 8.4 the polarity of the cell has reversed so that lead is anode and the cell is under anodic control. The corroding current is very small.

(4) In all of the above cases the corrosion is both chemical and electrochemical in character.

(5) The effects produced by various additions to the carbonate solution with a pH of 11.2 are as follows:

(a) Additions of  $Ag^+$ ,  $Bi^{+++}$ ,  $Cu^{++}$ ,  $Zn^{++}$  ions have no marked influence on the characteristics of the couple.

(b) Additions of  $Ni^{++}$  and agar-agar reduce the current in the cell without altering the potential.

(c) With all of the above additions the cell remains under cathode control.

(d) Potassium chromate and sodium silicate reduce both the potential and the current considerably. However, they also reverse the po-

larity of the cell so that lead becomes anode.

(6) Time-potential curves for lead in carbonate solutions with pH 8.4 to 11.2 have also been determined.

"Internal Oxidation in Dilute Alloys of Silver and of Some White Metals," by F. N. Rhines and A. H. Grobe of the Carnegie Institute of Technology, reported on a series of tests on about sixty alloys. Because of the present tin shortage, silver and other white metal alloys have received consideration for a number of new applications, including the making of collapsible tubes, and a knowledge of their working and polishing characteristics is desirable.

It is well known that when certain alloying elements are present in silver, thin external scale is formed when the alloy is heated in air, and in addition there may form a subscale or internal oxidation below the surface, which in ordinary Sterling silver is known as the "fire mark."

Several other alloys of silver, after oxidizing heat treatments, are known to show undesirable polishing characteristics that may be due to internal oxidation. It was thought that silver alloys might have similar oxidation behavior to that of the alloys of copper, upon which Dr. Rhines has reported in the past, and the present research has confirmed his anticipation.

A metallographic examination of 20 dilute alloys of silver, heated in air, showed internal oxidation in the alloys that contained Al, As, Bi, Cd, Cu, Fe, Ge, In, Mg, Mn, Pb, Sb, Si, Sn, Ti, Tl, Zn and Zr. In a similar study on 40 alloys in which the main constituents were cadmium, lead, tin or zinc, no instances of internal oxidation were found except in the Pb-Na, Sn-Al and Sn-Mg alloys.

The first session of the nonferrous metallurgy division was held on Wednesday afternoon, four papers being presented. In addition to zinc and lead, the metals that traditionally have been its primary concern, the division this year devoted time to certain of the other metals, namely indium and manganese, that are of importance to the defense program. A paper entitled "New Electrolytic Zinc Plant—American Zinc Co. of Illinois," and written by L. P. Davidson of the American Smelting Co. of Illinois, was read in Mr. Davidson's absence by the session chairman,

Dr. Herbert R. Hanley. A full description of the plant, which turns out zinc of 0.9995 purity, was given with flowsheet and production statistics. In addition to its electrolytic cells, this organization also has a retort plant in which the drosses and other materials not suited to electrolytic treatment, can be handled economically, thus making for a balanced production schedule.

"The Electrolytic Zinc Industry" presented by Arthur A. Center, consulting metallurgical engineer, New York, brought up to date a resume prepared by the author in 1939. At present all plants are operating at capacity, which in many cases has been increased within recent months. Improved details of cell construction and design have increased efficiency, and Cottrell precipitation units are saving much flue dust that had previously escaped. It is encouraging to learn, the speaker added, that even with many plants under Nazi control, the United Nations still have more electrolytic zinc capacity than the Axis.

"The Position of Zinc in National Defense" by Ernest V. Gent, executive secretary of the American Zinc Institute, opened the Thursday morning session of the Non-ferrous Metallurgy division. Die castings and rolled zinc have an important place, but zinc in the war program means principally brass and galvanized products, in which zinc is an indispensable although a minor component.

The author's point, therefore, is that the need for zinc will depend upon the quantity of copper which is assigned to brass-making, and the amount of steel which is to be galvanized. It was his conviction that zinc would be available to match all the copper set aside for brass-making, and to coat all the galvanized steel likely to be called for war purposes. Beyond the war requirements, the question will be a matter of the availability of the other metals—copper and steel, and (for die castings) aluminum and magnesium.

On the basis of past consumption and the best estimates now at hand



**T**HIS year's Howe Memorial Lecturer was Dr. John Johnston, director of research, United States Steel Corp.

for future requirements, Mr. Gent's appraisal indicates more than sufficient supplies in 1942 for war needs. This assumes a 10 per cent increase over 1941 domestic mine production and imports continuing at about the same rate as last year. If in 1943, he concluded, military needs should exceed the 1,074,000 tons which are indicated at that time, the zinc industry can be counted upon to do its share.

"The Bureau of Mines Manganese Pilot Plants at Boulder City, Nevada, for the Beneficiation of Domestic Ores" by R. S. Dean, metallurgical division of the U. S. Bureau of Mines, Salt Lake City, received much attention from the members and was the subject of interested discussion. Shortly after the fall of Poland, this project was initiated on a laboratory scale, to study the hundred or so types of manganese ores native to this country.

The present plants, which operate on a scale sufficiently large to demonstrate the amenability of the various typical ores to the various metallurgical methods, have been

in operation somewhat over a year. About 10,000 tons of samples of ore from many different districts are stock-piled there.

Although 97 per cent of our manganese needs are imported normally, we have extensive domestic reserves which can be utilized. Mostly these are of medium or low grade, and the function of these pilot plants is to work out the proper method for each type of ore. Equipment for all the promising methods, including the electrolytic, are provided, and their application to the various types of ore was described in full.

The Institute of Metals Lecture was delivered this year by W. Reuben Webster, chairman of the board of the Bridgeport Brass Co., and was entitled, "Notes on the History, Manufacture and Properties of Wrought Brass." Mr. Webster reviewed the development of the brass industry, which was brought here from England early in the 19th century, and which is still largely identified with Connecticut and New England. He described the old and new techniques of wire, rod and sheet making, and showed lantern slides of factories of yesterday and to-day. The electric furnace was introduced in 1916, and now over 90 per cent of all brass is melted in electric furnaces.

Inventors have long been intrigued by the thought of casting brass continuously—that is, by pouring it into a channel where it would solidify, and from which it could be drawn in a continuous length. Many patents have been issued, and some have even proven commercially successful. This revolutionary idea is destined to come into extensive use in the future.

The total production of brass follows closely that of steel, Mr. Webster said, being normally in the proportion of 18 lb. brass to the ton of steel. But with the present large demand for cartridge cases and the like, the production of brass is running ahead of that ratio.

Mr. Webster concluded with a tribute to value of the research man, and assured the engineers that while the war program has laid a heavy burden upon the industry, it will do its part.



# Pump Rotors Precision Made

**B**RINGING toolroom precision to the quantity production of an unusual part is now being accomplished in making the rotors used in the smallest series vane pumps produced by Vickers, Inc., Detroit, for application in operating hydraulic mechanisms in machine tools. From very limited quantities, production has been stepped up to 6000 per month. Extreme accuracy is necessary, since the efficiency of the pump depends upon the fit of the rotor in the casing and also upon the ability of the vanes to move freely in and out of the rotor slots without by-passing measurable quantities of hydraulic fluid. The vanes are held radially against the casing by oil pressure.

Of particular interest is the method now used to produce the slots in the rotor, also the means taken to eliminate wobble from the rotor. When originally made in small quantities, the slots, which are only 0.0780 to 0.0785 in. in width, 0.6145 in. long, and 17/32 in. deep, were milled one at a time after a small hole was drilled at the base of each slot to form a fillet. Difficulty was experienced in maintaining the alinement of the milling cutter with these holes on both sides of the rotor. Broaching was then considered as a more accurate means of cutting the slots. The needed tooling was developed by Colonial Broach Co., Detroit.

The slots are broached in two passes, two slots at a time. Spacing of the two broaches is approximately one-third the circumference of the part. Universal horizontal broaching machines equipped with broach guide bars are used for this operation. The first pass cuts about one-half of the total depth of the slots. The second pass completes the depth and shaping the rounded bottoms of the slots, previously formed by drilling. No further operations are necessary on the slots, after the rotors are hardened and ground. Using this method has virtually eliminated scrap.

Starting from the cold rolled bar stock, the first operation consists of roughing the rotor, including the drilling of the hub. In the second operation the spline is broached in the center portion of the hub. Next, all diameters of the rotor are finish turned on a splined mandrel, in-

cluding the chamfers at the ends of the hole which form centers for later grinding. This operation transfers the locating points from the spline to the chamfered ends of the bore and is considered the key to the accuracy with which the spline aligns with the rotor and hub ends after finish grinding.

A special machine, illustrated, was developed by New Method Steel Stamps, Inc., Detroit, to mark the periphery of the rotor with the direction of rotation, name and part number. This operation is performed prior to the slotting, so that it cannot possibly deflect the slots from true position. In this machine the splined portion of the

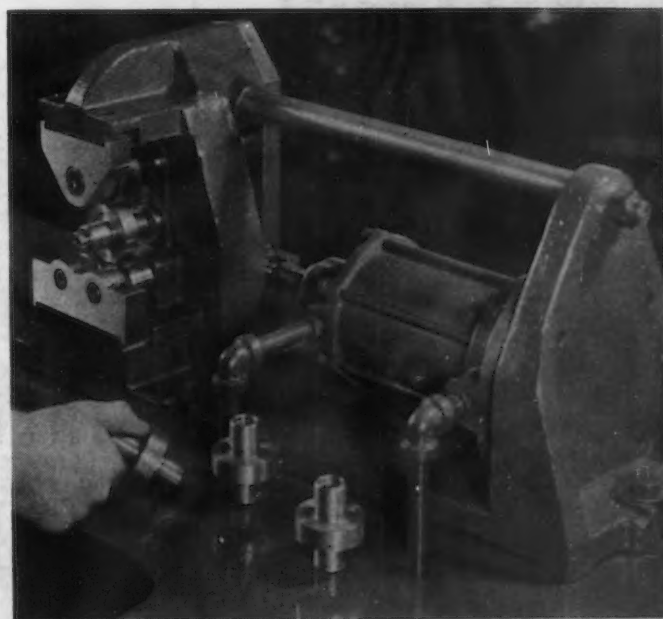
hole is used to locate the position of the markings and the marking die is rotated by an air cylinder operating through a crank and gears. The machine is capable of marking up to 500 rotors per hr. if required. The fifth operation is broaching the slots as previously noted.

After carburizing and hardening the rotors, the chamfered ends of the hole are lapped in a drill press to form centers for the subsequent grinding operation, which consists of finish grinding the o.d. and faces of the rotor and of the two ends of the hub. No commercially measurable wobble of the faces of the rotor relative to the hubs is permitted after grinding.

**S**LOTS are broached two at a time, using splined hub for locating and indexing. Second pass is illustrated. Limits on this Colonial set-up are held from 0.0780 to 0.0785 in. for slot width. Last few broach teeth form circular fillet at base of slots.



**V**ICKERS' name, part number and arrow are marked on a specially built roll marking machine, designed to place marks between slots when broached in the succeeding operation.



# Government Specifications for Aircraft Stainless Steel

... These specification briefs were prepared by the market research department of the Carnegie-Illinois Steel Corp., and are for information only and are not sufficiently complete to be employed for interpreting specifications or for dressing orders. The notations in the table are to be interpreted as follows: \* Magnaflex inspection specified; \*\* date amended; \*\*\* 0.15 per cent max. allowable for sheets 0.050 in. and thinner; \*\*\*\* a max. of 0.15 per cent allowable for 3/4 H and H tempers; † columbium content shall not be less than 10 times

the carbon content; †† titanium equal to not less than 5.5 times the effective carbon content may be furnished in lieu of the columbium content—effective carbon equals actual carbon minus 0.02; ‡ columbium and titanium are considered to be interchangeable as the stabilizing element—and unless otherwise specified, either may be furnished, at the option of the manufacturer, in an amount not less than 10 times the carbon content for columbium or not less than 5 times the carbon content for titanium.

## General Information

## Chemical Composition

## Properties and Purpose

Standard Type	Military Department	Government Specification Number	Specification Date	Carbon Max.	Manganese	Phosphorus Max.	Sulphur Max.	Silicon Max.	Chromium	Nickel	Copper Max.	Columbium, Titanium or Molybdenum	Properties and Purpose
...	Army	57-180-4	7-11-33	0.07	0.20-2.50	0.03	0.04	1.50	17.0 (min.)	8.0 (min.)	0.50	† and ††	Corrosion and heat-resistant welded tubing for exhaust stacks.
301	Army-Navy	AN-QQ-S-771	3-19-41	0.12	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	†	Parts requiring general corrosion resistance. For bars and rods.
316	Army-Navy	AN-QQ-S-771	3-19-41	0.10	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	2.00-3.00 Mo.	Parts requiring maximum corrosion resistance. For bars and rods.
303	Army-Navy	AN-QQ-S-771	3-19-41	0.10	0.20-2.50	0.17	0.10	0.20-1.50	17.0-20.0	7.0-12.0	0.50	0.75 Max. mo.	Parts requiring general corrosion resistance and free-machining. For bars and rods.
414	Air-Corps	10080-A	1-27-41	0.010-15	0.30-0.60	0.03	0.03	....	12.0-13.5	1.25-2.00	....	....	Low-carbon high-chromium steel bars suitable for general machining and forging purposes used in parts requiring moderately high resistance to corrosion.
347 or 321	Army-Navy	AN-QQ-S-757	12-14-40 **6-12-41	0.08	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	†	Corrosion and heat-resisting plate, sheet and strip for exhaust stacks, manifolds and collector rings and similar applications requiring weldable corrosion and heat-resisting steel.
301	Army-Navy	AN-QQ-S-772	3-19-41	***0.12	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	....	Corrosion-resisting sheet and strip for structural parts of aircraft involving spot welding, but where gas and arc welding and elevated temperatures are not encountered.
316	Army-Navy	AN-QQ-S-772	3-19-41	0.10	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	2.00-3.00 Mo.	Corrosion-resisting sheet and strip for structural parts of aircraft involving spot welding, but where gas and arc welding and elevated temperatures are not encountered.
316	Army-Navy	AN-QQ-W-423	3-13-41	0.10	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	2.00-3.00 Mo.	Corrosion-resisting springs, cowls pins, etc., and parts where welding and elevated temperatures are not involved.
...	Army-Navy	AN-WW-T-855	1-21-41	****0.12	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	....	Corrosion-resisting seamless tubing intended for structural parts where a corrosion-resisting steel is required but where gas welding and elevated temperatures are not involved.
347 or 321	Army-Navy	AN-WW-T-858	12-14-40	0.08	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	†	Corrosion and heat-resisting seamless tubing for exhaust stacks, manifolds and collector rings and similar applications where a weldable corrosion and heat-resisting steel is required.
...	Army-Navy	AN-WW-T-861	12-14-40	0.08	0.20-2.50	0.03	0.03	0.20-1.50	17.0-20.0	7.0-12.0	0.50	†	Corrosion and heat-resisting welded tubing for exhaust stacks, manifolds and collector rings and similar applications where a weldable corrosion and heat-resisting steel is required.
...	*W. D. 51235	57-107-13	11-16-27 **2-20-41	0.30-0.40	0.50 max.	0.035	0.035	0.50	11.5-14.0	....	....	....	Medium-carbon high-chromium steel bars.
431	Army-Navy	AN-QQ-S-770	3-10-41	0.15	0.30-0.75	0.03	0.04	0.20-0.60	15.50-17.50	1.50-2.50	....	....	Corrosion-resisting bars and rods intended for bolts, tie rod terminals and other parts requiring high strength and corrosion resistance. Material does not "seize" when threaded to corrosion-resisting steel of 18-8 type.
302	Army-Navy	AN-RR-C-48	11-20-40	....	....	....	....	....	17.0	8.0	....	....	For flexible preformed cable intended for general aircraft use where high resistance to corrosion is required.
316	Army-Navy	AN-RR-C-48	11-20-40	....	....	....	....	....	17.0	8.0	....	2.50 Min. mo.	For flexible preformed cable intended for general aircraft use where high resistance to corrosion is required.



• • • These specification briefs were prepared by the market research department of the Carnegie-Illinois Steel Corp., and are for information only and are not sufficiently complete to be

PHYSICAL CONDITION	(E) or (5)—Quenched and drawn (heat treated); For stainless, normalized and tempered.	SURFACE CONDITION
(A) or (1)—As forged.		(A) or (1)—Black as forged or rolled.
(B) or (2)—As rolled.		(B) or (2)—Pickled or blast cleaned.
(C) or (3)—Annealed.		(C) or (3)—Rough turned.
(D) or (4)—Normalized and annealed.		(D) or (4)—Cold rolled or cold drawn.

(Continued on Next Page)

(Continued)

## Government Specifications for Aircraft Carbon and Alloy Steel

... These specification briefs were prepared by the market research department of the Carnegie-Illinois Steel Corp., and are for information only and are not sufficiently complete to be

employed for interpreting specifications or for dressing orders. The designation \*\* shows the date a specification was amended; the explanations of the condition codes are as follows:

**PHYSICAL CONDITION**  
(A) or (1)—As forged.  
(B) or (2)—As rolled.  
(C) or (3)—Annealed.  
(D) or (4)—Normalized and annealed.

**SURFACE CONDITION**  
(A) or (1)—Black as forged or rolled.  
(B) or (2)—Pickled or blast cleaned.  
(C) or (3)—Rough turned.  
(D) or (4)—Cold rolled or cold drawn.

**HEAT TREATMENT CODE**  
AF—As furnished.  
N—Normalized.  
A—Annealed.  
Q—Quenched.  
T—Tempered.

**(E) or (5)—Surface ground.**

### General Information

### Chemical Composition

### Physical Properties

Government, Army, Navy, etc. Specification Number	Speci- fication Date	Carbon Range	Man- ganese Range	Phos- phorus Maxi- mum	Sulphur Maxi- mum	Silicon Range	Nickel Range	Chro- mium Range	Molyb- denum Range	Van- adium Range	Tungsten Range	Tensile, Lb. Per Sq. In. Min.	Yield, Lb. Per Sq. In. Min.	Elongation, Per Cent in 2 In.	Hardness	Condition of Physical Test (see Code)	Condition of Material Usually Furnished	Usual Commodity Furnished
A-57-107-3A	8-11-38 **3-7-39	0.35-0.45	0.60-0.90	0.040	0.050	.....	1.00-1.50	0.45-0.75	.....	.....	.....	150,000	125,000	16	Brinell 300-340 Rockwell C30-C35	Q & T	Physical (D) surface (D); Bars 1 in. and over Physical (G), surface (B).	Bars and billets.
AN-9246	1-5-38	0.35-0.45	0.60-0.90	0.040	0.050	.....	1.00-1.50	0.45-0.75	.....	.....	.....	150,000	125,000	16	Brinell 300-340 Rockwell C30-C35	Q & T	Physical (D) surface (D); bars 1 in. and over physical (G), surface (B).	Bars and billets.
A-57-107-4	3-3-27 **3-7-39	0.35-0.45 0.10-0.20 0.35-0.45	0.60-0.90 0.30-0.60 0.30-0.60	0.040 0.040 0.040	0.050 0.050 0.040	..... 0.15-0.35	1.00-1.50 1.50-2.00 1.50-2.00	0.60-0.90 0.90-1.25 0.90-1.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
A-57-107-5	3-3-27 **3-7-39	0.45-0.55	0.30-0.60	0.040	0.040	0.15-0.35	1.50-2.00	0.90-1.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
A-57-107-SSA	10-9-40	0.08-0.12	0.30-0.60	0.040	0.050	.....	3.25-4.00	1.25-1.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
A-57-107-22A	10-9-40	0.14-0.19	0.30-0.60	0.040	0.050	.....	3.25-4.00	1.25-1.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
A-57-107-7	3-3-27 **2-20-41	0.35-0.45 0.30-0.40	0.30-0.60 0.45-0.75	0.040 0.040	0.050 0.040	0.15-0.35	3.25-3.75 2.75-3.25	1.25-1.75 0.60-0.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NAF-Sheet No. 1B EMS-1B	4-26-39 **1-29-40	0.35-0.45	0.60-0.90	0.040	0.045	.....	1.00-1.50	0.45-0.75	.....	.....	.....	1— in. and under 90,000 over — in. 90,000	.....	17	.....	AF	Normalized for machin- ability.	Bars.
NAF-Sheet No. 2B EMS-2B	4-16-39 **1-30-40	0.10-0.20	0.30-0.60	0.035	0.035	.....	1.00-1.50	0.45-0.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NAF-Sheet No. 3B EMS-3B	5-16-39 **1-30-40	0.17 max.	0.30-0.60	0.035	0.035	.....	4.75-5.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NAF-Sheet No. 4B EMS-4B	5-16-39 **1-30-40	0.12 max.	0.30-0.60	0.035	0.035	.....	3.25-3.75	1.25-1.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NAF-Sheet No. 5 EMS-5	11-9-38 **1-30-40	0.12 max.	0.30-0.60	0.035	0.035	.....	3.25-3.75	1.25-1.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NAF-Sheet No. 8 EMS-8	11-21-38 **1-30-40	0.12-0.18	0.40-0.70	0.035	0.035	.....	1.65-2.00	0.20-0.30	0.20-0.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
N-48S32A N-47S14B	11-1-39 11-1-38	0.10-0.20 0.25-0.35	0.40-0.70 0.40-0.60	0.040 0.040	0.050 0.045	.....	1.62-2.00 .....	0.60-1.10 .....	0.20-0.30 0.15-0.25	.....	.....	90,000	70,000	varies with thickness 10-20	.....	N	Normalized.	Billets. Sheet, strip and plate.
AN-9090C	11-11-32	0.25-0.35	0.40-0.60	0.040	0.045	.....	.....	0.80-1.10	0.15-0.25	.....	.....	90,000	70,000	varies with thickness 10-20	.....	N	Normalized.	Sheet, strip and plate.



A-57-107-19B	6-20-33 **2-20-41	0.25-0.35	0.40-0.70	0.040	0.045	0.15-0.30	0.50-0.80	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (D) 3 in. and over, Physical (C) surface (B).	Bars.
AN-9081A	4-17-33	0.25-0.35	0.40-0.70	0.040	0.045	0.15-0.30	0.50-0.80	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (D) 3 in. and over, Physical (C) surface (B).	Bars.
AN-9081A	4-17-33	0.25-0.35	0.40-0.60	0.040	0.045	0.15-0.30	0.80-1.10	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (D) 3 in. and over, Physical (C) surface (B).	Bars.
A-57-107-19B	6-20-33 **2-20-41	0.25-0.35	0.40-0.60	0.040	0.045	0.15-0.30	0.80-1.10	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (D) 3 in. and over, Physical (C) surface (B).	Bars.
A-57-180-2D	11-28-40 **1-21-41	0.27-0.33	0.40-0.60	0.040	0.045	0.15-0.30	0.80-1.10	0.15-0.25	(See specification for detail)			N, A, N & T, Q & T	Normalized or otherwise heat treated.	Tubing, seamless.
A-57-138-8C	4-17-33 **1-10-39	0.25-0.35	0.40-0.60	0.040	0.045	0.15-0.30	0.80-1.10	0.15-0.25	90,000	70,000	varies with thickness 10-20	Q & T	Physical (D) surface (D) 3 in. and over, Physical (C) surface (B).	Sheet, strip and plate.
N-46S23g	10-1-40	0.30-0.35	0.40-0.60	0.040	0.050	Elec. Fee, 0.15 Min.	0.80-1.10	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (4).	Bars.
A-10239	11-6-40	0.32-0.39	0.40-0.60	0.040	0.045	0.15-0.30	0.80-1.10	0.15-0.25	(See specification for detail)			Q & T	(see specification)	Tubing, seamless.
A-10063	3-25-35 **3-3-39	0.35-0.45	0.60-0.90	0.040	0.050	0.15-0.30	0.80-1.10	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (D) 3 in. and over, Physical (C) surface (B).	Bars.
N-46S23g	10-1-40	0.45-0.55	0.60-0.90	0.040	0.050	Elec. Fee, 0.15 Min.	0.80-1.10	0.15-0.25	125,000	100,000	18	Q & T	Physical (D) surface (4).	Bars.
A-11062D	7-28-38 **3-3-39	0.35-0.45	0.50-0.80	0.040	0.050	0.15-0.30	0.60-0.90	0.20-0.30	150,000	130,000	16	Q & T	Physical (D) surface (D) 1 in. and over, Physical (C) surface (B).	Bars and billets.
N-46S28b	2-1-39	0.35-0.45	0.50-0.80	0.040	0.050	0.30 Max.	0.60-0.90	0.20-0.30	150,000	130,000	16	Q & T	Physical (D) surface (D) 1 in. and over, Physical (C) surface (B).	Bars and billets.
AN-9208	.....	0.35-0.45	0.50-0.80	0.040	0.050	0.30 Max.	0.60-0.90	0.20-0.30	150,000	130,000	16	Q & T	Physical (D) surface (D) 1 in. and over, Physical (C) surface (B).	Bars and billets.
N-46S32a Class C A-10240 Grade I	11-1-35 9-27-40	0.10-0.20 0.11-0.17	0.40-0.70 0.40-0.70	0.040 0.040	0.050 0.050	.....	0.20-0.30 0.20-0.30	0.20-0.30	.....	.....	.....	Q	Physical (E) surface (2) Brinell 229 max.	Bars, rods and billets.
A-10240 Grade II	9-27-40	0.15-0.20	0.40-0.70	0.040	0.050	.....	0.20-0.30	0.20-0.30	.....	.....	.....	Q	Physical (E) surface (2) Brinell 229 max.	Bars, rods and billets.
A-10240 Grade III	9-27-40	0.18-0.23	0.40-0.70	0.040	0.050	.....	0.20-0.30	0.20-0.30	.....	.....	.....	Q	Physical (E) surface (2) Brinell 229 max.	Bars, rods and billets.
A-57-107-10	12-20-27 **2-21-41	0.15-0.25 0.35-0.45	0.40-0.70 0.50-0.80	0.040 0.040	0.050 0.050	.....	0.20-0.30 0.20-0.30	0.20-0.30	.....	.....	.....	.....	.....	.....
A-57-136-7	3-24-27	0.25-0.35	0.50-0.80	0.040	0.040	0.15-0.35	0.60-1.10	0.15-0.18	125,000	100,000	1 1/2 in. or over 1 1/2 in. Under 1 1/2 in.	N or A	Annealed or normalized and annealed.	Bars for wrist pins and pinions. Sheet or strip for fittings and misc. parts.
A-57-107-16	11-16-27 **2-19-41	0.25-0.35	0.50-0.80	0.040	0.040	0.15-0.35	0.80-1.10	0.15-0.18	.....	.....	.....	.....	.....	.....
A-57-107-2A	10-28-31 **2-20-41	0.30-0.40	0.50-0.80	0.040	0.045	0.15-0.35	0.80-1.10	0.15-0.25	125,000	100,000	16	Q & T	Annealed.	Bars and billets.
AN-9134	6-15-30	0.30-0.40	0.50-0.80	0.040	0.045	0.15-0.35	0.80-1.10	0.15-0.25	125,000	100,000	16	Q & T	Annealed.	Bars and billets.
N-46S25	11-2-31	0.30-0.40	0.50-0.80	0.040	0.045	0.15-0.35	0.80-1.10	0.15-0.25	125,000	100,000	16	Q & T	Annealed.	Bars and billets.
N-46S31 Type II	7-1-35	0.45-0.50	0.70-0.90	0.040	0.040	3.00-3.50	0.25-0.35	0.18 Min.	200,000	150,000	6	Q & T	(See specifications for details) Centerless ground, fully annealed.	Rods for helical springs for landing gear, cruci- ble or electric fur- naces.
AN-Q-Q-S-887	5-23-39 **E-9-40	0.45-0.55	0.60-0.90	0.040	0.050	.....	0.80-1.10	0.15 Min.	150,000	125,000	14	Q & T	Physical (C) surface (4).	Bars and billets.
N-46S31 Type I	7-1-35	0.45-0.55	0.60-0.80	0.025	0.025	.....	0.80-1.10	0.15-0.25	200,000	150,000	6	Q & T	Centerless ground, fully annealed.	Rods for helical springs for landing gear, elec- tric furnace or crucible.
A-57-107-11	11-16-27 **2-20-41	0.90-1.05	0.20-0.45	0.030	0.030	0.10-0.35	0.80-1.10	Min. desired 0.15-0.18	.....	.....	.....	.....	.....	.....
A-57-107-21	13-30-27	0.90-0.70	0.30 max.	0.035	0.035	0.15-0.35	0.50-1.00	.....	.....	.....	.....	.....	.....	Bars.

# New Equipment . . .

## Plant Service

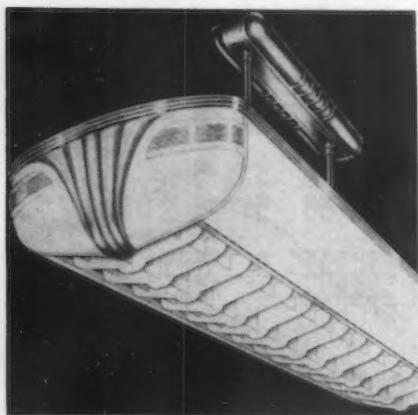
Improved plant lighting, safety, and employee comfort equipment are described in the following items.

**THE STEBER MFG. CO.**, Chicago, announces a line of floodlights for outdoor lighting. In the new No. 3500 unit, the reflector is of heavy gage spun steel with a

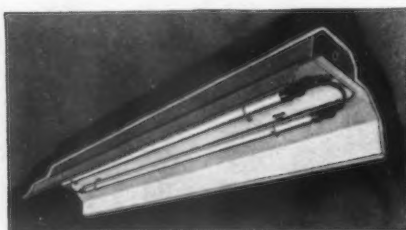


copper and nickel base plating and a chrome finish plating. Exterior of the light is of aluminum Ultramel, it has a 15 $\frac{1}{4}$  in. reflector, and uses 750 to 1500 watt lamps.

**A** NEW type luminaire, made of molded plastic and baked enamel sheet steel, has been developed by *Day-Brite Lighting, Inc.*, St. Louis. Louvers provide shielding from normal vision line, and the design permits a large area of light source and well diffused, shadowless direct light.

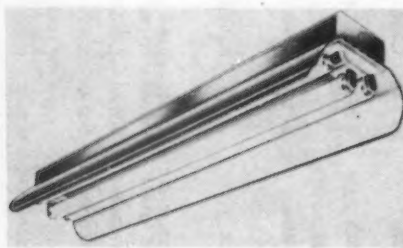


**A** NEW luminaire using two or three 40-watt fluorescent lamps per reflector and providing lighting intensities of from 30 to 100 ft.-candles with maximum diffusion, minimum glare, and uniform distribution has been designed by *Westinghouse*. The units have built-in compensators providing a power factor of 90 per cent or over, and luminaire channels provide a continuous wireway that may be



mounted on conduit, messenger cable, twin-rod suspension, or directly on the ceiling.

**A** NEW fixture holding three 40-watt, 48-in. fluorescent tubes is made by *Day Brite Lighting, Inc.*, St. Louis. The porcelain enamel reflector is made in one piece, finished in one ground coat and two white coats inside. The unit can be furnished wired or unwired and includes sockets, lamp starters, and ballasts.



**A** NEW type concentrating floodlight bulb for high bay lighting in industrial plants has been developed by *Wabash Appliance Corp.*,

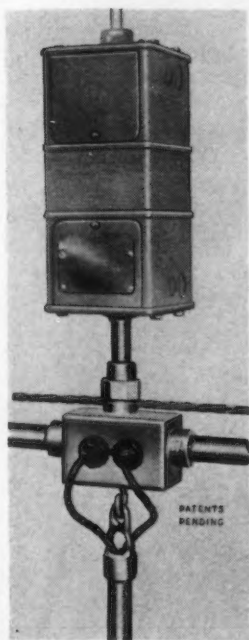


Brooklyn, N. Y.. The bulb is said to be able to deliver a concentrated flood of light through the haze and smoke in foundries and factories, the inside of the bulb being lined with polished silver, forming a permanent, brilliant reflector that cannot be dimmed by dirt, fumes or smoke. The bulb is made in 12 sizes.

### Conduit Fitting

**A** FIXTURE hanger designed for installing the combination mercury vapor and incandescent lamp fixtures used widely in industrial plant lighting has been developed by the *Pyle-National Co.*, 1334 North Kostner Avenue, Chicago. In the U series fixture hanger, the transformer weight is carried by the support rod attached to the ceiling structure; the lighting fixtures only are below the messenger or support wire. The union hub of the



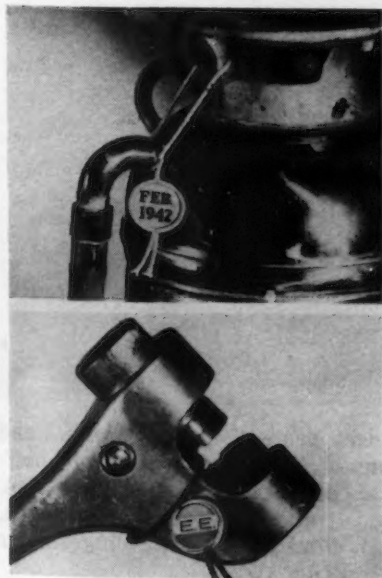


Pylet is slotted to receive the messenger wire. The Pylet body will take a single or two gang receptacle providing for attachment plug connections to the mercury vapor and incandescent lamp circuits. A hood at the bottom of the body is

used to fit the Pyle-National type A double outlet fixture loop for two portable cords.

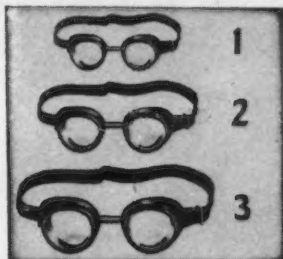
#### Tamper-proof Seals

A TAMPER-proof safety and inspection seal that allows for secret identification markings has been developed by *Stoffel Seals Co.*, 188 Water Street, New York. The seal is made up of two parts, the pre-shaped metal seal-cup and the identification disk that can be colored to indicate jobs, location, processes, etc. Further markings can be incorporated in the sealing pliers, and the seal can be applied with string, cord, or two-ply wire.



#### Safety Goggles

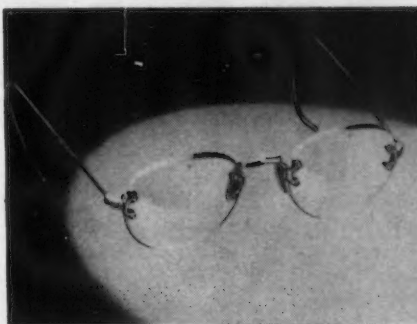
**KIMBALL SAFETY PRODUCTS CO.**, Cleveland, introduced a new line of safety goggles, called Face-Fitt, that have compo-



sition frames and are available in three sizes. All sizes are of drop-eye shape, better suited to the contour of the eye socket, and are light in weight. Ventilation is provided by more than 700 holes in the top and bottom, as contrasted to the 265 holes required by government standards.

#### Rimless Safety Glasses

**THE TULCA DIVISION OF THE UNIVIS LENS CO.**, Dayton, Ohio, added a new rimless-type, safety spectacle to its eye



protection line recently. The Supervisor spectacle is fitted with Tulca safety lenses, which are not glass, and come with or without side shields. These spectacles were designed specifically for use by supervisors, checkers, inspectors, and others not engaged in operations but exposed to some extent to eye hazards.

#### Wall Coatings

**THE BERGONIZE CO.**, Chicago, announced a new washable, protective covering for flat wall paint for use in plants, warehouses, and offices. The coating provides a clear film which protects the surfaces from dirt and grime. It dries in 20 min. at 70 deg. F.

#### Eye Guards

TO provide unrestricted wide-angle vision and complete eye protection, the **B. F. McDonald Co.**, 1248 South Hope Street, Los Angeles, designed I-Gards, a new, plastic shield that is produced without individual grinding of lenses. I-Gards are clear or tinted plastic, injection molded under rigid controls that assure optical accuracy and maximum strength. Unusual



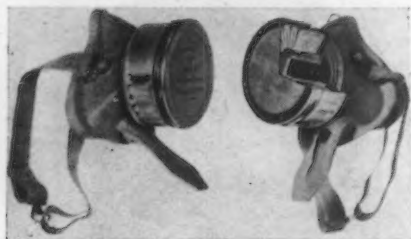
design eliminates pressure on the bridge of the nose and on the ears, and adequate ventilation prevents fogging.

#### Negative Temperature Resistors

**THE KEYSTONE CARBON CO.**, St. Marys, Pa., announced a line of negative temperature coefficient resistors with metal coated ends making electrical connections. Formerly made with molded-in wires, the addition of resistors with metal coated ends increase the range of application by permitting the use of a cartridge or clip method of mounting. These resistors are useful where it is desired to reduce or eliminate initial current surges, to obtain a time delay or gradual building up of current through a machine, to provide temperature compensation in apparatus which exhibit rising resistance with increase in temperature, and for other applications where a negative temperature coefficient is required. The resistors are made in the following sizes: 5/32 to 3/8 in., 5/32 to 1/2 in., 5/32 to 1 in., and 1/4 to 1 in., with maximum wattage ratings ranging from 0.75 to 3.0 watts.

### Respirators

**V**ARIOUS types of respirators for protection against inhalation of dusts have recently been developed. *The DeVilbiss Co.*, Toledo, Ohio, announced a respirator said to embody nine unique features, measuring  $2\frac{7}{8} \times 1\frac{1}{2}$  in., weighing only 1 oz., and providing 41 sq. in. of breathing filtering area. The unit can be easily cleaned with an air dusting gun or nozzle, and it is designed to fit snug without leakage.



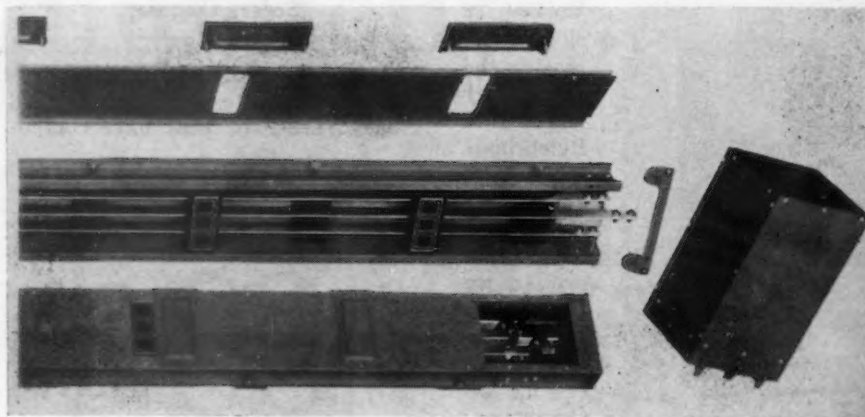
**T**HE M.S.A. single filter Dustfoe respirator, made by the *Mine Safety Appliances Co.*, Pittsburgh, is designed to prevent rapid build-up of breathing resistance through clogging of filter. The unit can be completely disassembled without tools in a few seconds, every part



is interchangeable, and can be washed and sterilized except the filters. It is light in weight and uses inexpensive, throw-away filters.

### Bus Duct

**F**OR industrial secondary power distribution systems, *Westinghouse* announces a new bus duct of the plug-in and feeder type. Composed of copper busses, Prestite separators, and dust-tight metal enclosures, the units are made in ratings from 250 through 1500 amp. Plug-in sections are supplied in 10 ft. line units with outlet service staggered every 12 in. along the



run. To install, the bus duct is hung by narrow double-strap hangers either edgewise or flat, depending upon availability of plug-in. Where suspension rods are used,

fastening is made to any convenient overhead suspension point and an adjustable cantilever clamp slides along the duct to the point of alignment.

### Hand Cream

**T**O protect the hands against cracking, drying, and soreness because of exposure to dyes, chemical, cutting oil, solvents, and other skin irritating materials in shops, plants, and factories, the *Prack Laboratories, Inc.*, New York, developed Practi-Kreme. The cream provides a thin, invisible insulation between the skin and dirt and grease, retarding the penetration of these materials into the pores and skin crevices. Also, applications on dirty hands loosen and absorb surface residues of these harsh materials and permit their removal by normal washing.

### Sweatbands

**A** NEW, lightweight, absorbent sweatband, made of synthetic sponge, was announced by the *American Optical Co.*, Southbridge, Mass. The  $7\frac{1}{2}$  in. long sponge can be sterilized and keeps perspiration out of the workman's eyes and off goggles.



### Rust Preventive

**A** NEW rust preventive is announced by the *Milburn Co.*, Detroit, in the form of a hand cream known as Ply-Rustex which is applied to the hands of workers before handling highly polished metal surfaces. Perspiration corrosion and other forms of rust caused by handling metals during machining and processing are eliminated by the use of this cream, enabling free handling without gloves of any metal part. The cream is non-toxic, easily applied and removed, and prevents irritations that may result in many forms of industrial skin disorders and dermatoses.

### Finger Guards

**A** FINGER guard combining a tough leather with flexible lastex was recently designed by the *Industrial Gloves Co.*, Danville, Ill. The new guard is clean, comfortable, durable and light, and pro-



vides protection to fingers and thumb in any combination to buffers, polishers, sanders, grinders, etc. It may be worn under a glove, and eliminates taping fingers for protection.



nt  
an  
es  
e-

n-  
o.,  
am  
p-  
e-  
tal  
on  
by  
ng  
by  
ree  
ny  
ic,  
nd  
re-  
ial

ng  
ble  
he  
ill.  
rt-  
ro-

and  
uff-  
ers,  
ve,  
for



Milwaukee Model K Vertical Milling Machine

**Tools That Put More  
Production Minutes Into the Hour.**

**KEARNEY & TRECKER CORP., MILWAUKEE, WIS., U. S. A.**



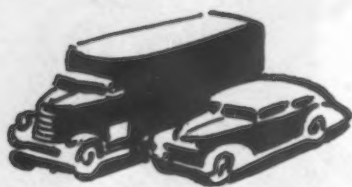
**KEARNEY & TRECKER  
CORPORATION**

**Milwaukee  
MILLING MACHINES**

**Milwaukee MILLING MACHINES**

# Assembly Line . . .

• New tank lines will yield volume output by early summer . . . Fisher displays preparation for entirely new system of manufacture . . . Auto production equipment pushed out into open fields.



**D**ETROIT—Advent of the all-welded tank as part of the military equipment of U. S. armored forces has presented some new manufacturing problems which are currently being solved and has, incidentally, opened up fresh opportunities for the auto industry to apply its mass-production technique.

The job of tank building is more like ship building than automobile building, so the strides made here in the past year—and the spectacular ones which will shortly be revealed—are the more noteworthy.

It was only ten months ago that Chrysler was still engaged in tooling up to build the M-3 tank and had just progressed far enough in its preparations to unveil a pilot model handmade by itself and suppliers. The M-3, now widely known as the nation's principle tank weapon, is a 28-ton so-called medium tank; it was the first standardized design and the first attempt at mass-production by a nation that had made only some thirty experimental tanks in all the years since the last war. When this monster began rolling down three Chrysler assembly lines, and coming out of several other tank shops in volume, there was presented the first evidence that auto-building practices could be applied in this effort. Visitors to Detroit soon found out that the tank assembly lines, when they

could get permission to view them, were even more glamorous than the world-renowned auto assembly lines.

**N**OW there are going to be new models. On expanded Chrysler lines, and on new production facilities being set up by Ford and General Motors, the new M-4 and the 60-ton M-1 types will go into production this spring, with real volume starting in early summer.

Last week a sanctioned preview peak at the welded hull of the M-4 was granted by Fisher Body, the GM division which will fabricate both types (the M-1 and M-4) in its main plant, the world's largest auto body plant, and will assemble and test them at a new tank arsenal a few miles away. Along with a view of the first hull, Fisher displayed the vast preparations which are being made for an entirely new system of tank manufacture.

Later, a checkup showed that these new manufacturing processes are going to be quite generally adopted in tank manufacture. Changes are expected to result in better tanks, more quickly made.

First lesson being applied from the automotive text is the one learned when volume output of auto bodies first was projected: you can weld them quicker and cheaper than you can rivet them. That is almost a literal quote that has been heard scores of times in auto body shops.

Second, assembly jigs will be provided for every phase of the welding job. There will be 15 final assembly jigs for welding hulls in the Fisher plant alone. This follows another automotive axiom: You can't weld them, until you hold them. There is no slip-up when every piece is firmly in place before welding starts.

Third, the welding process is going to be (after a very short while) as completely automatic as possible. As in automotive practice, the skill on the job, or most of it, will be built into the machine.

Fourth, welds will be eliminated wherever possible by incorporating desired shapes in the material. Fisher will use an 80-ton mechanical press (Hamilton) to bend armor plate where possible. Every bend will eliminate a weld and contribute something to the speed of manufacture and quality of the product.

**T**HE welding job is far afield from that which body plants have previously done; armor plate in varying thicknesses up to approximately three inches makes auto body sheet look paper-thin in comparison. But J. E. Goodman, plant manager, is already displaying the first sample hull which has been manually welded and should be operating on the test grounds in less than two weeks. Meanwhile, Fisher has in operation three welding schools and will have 1000 trained welders, all certificated, by the time the new tank arsenal is ready on June 1. The welders will be former auto body workers. And Fisher has gone ahead in conjunction with welding equipment manufacturers and is preparing to do the production job with a patented process that will do the welding in a single pass, instead of the 15 or more passes required in manual welding. Fisher is also making use of flame cutting to double-bevel the plates.

As indicated above, the welding of tanks in the automotive industry is to be practiced also by Ford and Chrysler, and by firms like Briggs and Midland, which also will take part in tank production in this area. It is understood that all of them have purchased Unionmelt equipment similar to that described in *IRON AGE*, Jan. 15 and 21, in articles on plate cutting and arc welding. As seen at Fisher, the plates are to be flame cut, mounted in the jigs, arc welded with a single pass on each side of the bevel joint. Some fillet welds, but apparently no butt welds are contemplated. It is understood that Fisher engineers have already made some important contributions to the use of the process in tank construction.

The jigs bear little resemblance to body welding jigs. The one for final assembly of the hull plates and subassemblies is an example. It is a fearsomely big thing, weighing 30 tons, equivalent to the final weight of the entire tank. It consists of heavy welded plate which will surround and hold in place all the pieces prior to welding. The entire jig will be mounted in a framework which will permit it to be turned end-over-end or barrel-wise so no overhead welding will be necessary and so the welding heads can reach the places where work is



# TO SERVE AMERICAN INDUSTRY!

## Lebanon Prepares New Reference Chart COVERS STAINLESS STEELS ... BOTH CAST AND WROUGHT

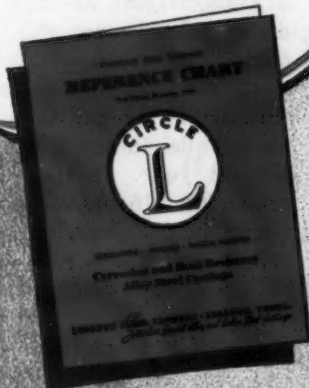
IN AMERICAN INDUSTRY, there is great need for more information about the alloys that guard against the greatest saboteur of all—corrosion. Lebanon helps meet this need with a new reference chart covering CIRCLE L Stainless and Corrosion Resistant Alloys in comparison with wrought and cast material specifications of comparable analyses. Such information has never before been correlated in a single handy reference. This new chart provides a "thumbnail encyclopedia" for users of stainless and corrosion resistant alloys who wish to make quick comparisons. It is part of the Lebanon plan to provide interested manufacturers with *practical and helpful* information.

### EASY TO KEEP HANDY! EASY TO USE!

This convenient, informative Lebanon reference chart provides specific data. (Designations, alloying elements, physical properties, heat treatment.) The complete chart is available to executives, engineers and metallurgists upon request.

### LEBANON STEEL FOUNDRY LEBANON, PENNSYLVANIA

ORIGINAL AMERICAN LICENSEE  
GEORGE FISCHER (SWISS CHAMOTTE) METHOD



Lebanon Designation	A. C. I.* Standard Designation	A. I. S. I. Type No.	A. S. T. M. Designation	Other Designations
Ⓛ 10		501	A157 Grade C5A	
Ⓛ 11	CB-30	442		Hydraulic Institute Type No. 1
Ⓛ 12	CA-14	403 410	A157 Grade C6	SAE No. 51210 Hydraulic Institute Type No. 0
Ⓛ 13	CA-10	420F		SAE No. 51335
Ⓛ 14		442		Carpenter No. 3
Ⓛ 15	CC-35	446		Hydraulic Institute Type No. 2
Ⓛ 21	CE-7C	349	A157 Grade C9	U. S. Navy 46827a Grade No. 1 Weld SAE No. 30705 Hydraulic Institute Type No. 3
Ⓛ 22	CF-7	304	A157 Grade C9	KA2S Hydraulic Institute Type No. 3 U. S. Navy 46827a Grade No. 1 SAE No. 30905
Ⓛ 22M	CF-7-SE		A157 Grade C9	U. S. Navy 46827a Grade No. 7
Ⓛ 22XM	CF-7M	317	A157 Grade C9	KA2SMo. SAE No. 30805 Hydraulic Institute Type No. 4
Ⓛ 23	CF-20	302	A157 Grade C9	KA2 SAE No. 30915
Ⓛ 23M	CF-20SE	303	A157 Grade C9	SAE No. 30615 Type 2
Ⓛ 23XM	CF-20M		A157 Grade C9	KA2Mo.
Ⓛ 24	CM-25	325	A157 Grade C10	
Ⓛ 25	CG-20			
Ⓛ 30	CH-20	309		
Ⓛ 30Cb.	CH-10C			
Ⓛ 30XM	CH-20M			
Ⓛ 31	CE-30	312		
Ⓛ 32XMC				
Ⓛ 33				Worthite Hydraulic Institute Type No. 5
Ⓛ 34				duPont No. 1364 (FA-20) Hydraulic Institute Type No. 5

LEBANON *Stainless and Special Alloy* STEEL CASTINGS



to be done. The rotating will be performed by electric motors geared to the jig. While this jig bears little resemblance to a body jig, this is essentially just the application of the body-building practice of providing jigs into which all of the panels and subassemblies are clamped prior to welding.

**F**ISHER also is making progress in the forming of armor plate, as already stated, but this usage of presses will keep only a very small percentage of the plant's press equipment at work. Actually it is estimated that one press can do most of the work required, and some 39 or 40 like this one will remain idle. The biggest presses will be left in place, because it is impracticable to move them, but all the other presses, conveyors, auto welding equipment, paint booths, ovens and trim shop equipment have been cleared out, some of it piled up in an unused area of the building, some of it out under the snow.

This plant was just one of ten visited last week in a checkup on conversion of auto plants to war work. Except for one Chevrolet plant concentrating on war truck output, every one has been stripped of every last vestige of automotive production equipment. Most of the machines, conveyors and other equipment swept out of the plants in the last few weeks lies in open fields, covered with the snows of Michigan winter.

This is a drama, but not a pleasant one. Millions of dollars worth of presses—which are not much in demand in war work because military equipment is not made of light stampings—and thousands of special machine tools which cannot be adapted to war work are shoved out under the skies. These machines, if adaptable to any other firm's war work, are available on a lease, loan or sale basis to anyone, according to auto plant executives. But many of them are simply not adaptable, some engine manufacturing equipment and press shop equipment having been demonstrated as 95 per cent useless in any tasks but those for which they were originally purchased—and generally designed—by the auto plants. In Chevrolet plant No. 6, 2500 such machines

have been cleared out in the past fortnight.

There are exceptions, of course, and everyone is glad that there are. The fact that 80 to 90 per cent of the machines used on some parts work are adaptable is a godsend, and helps to account for the fact that, industrywise, there probably will be a 50 per cent utilization of equipment on war work.

To speed the program, Fisher is building planers and boring mills at its Grand Rapids plant and is using some of this new equipment already. Also, this Flint plant has purchased some old machine tools and is now rebuilding them for use on tank parts. Chevrolet, too, is rebuilding equipment, including a roomful of Bullards and boring mills. Some of these have a history behind them, having been purchased 25 years ago for use at Flint, shipped later to Chevrolet-Toledo, thence to Chevrolet-Tonawanda, N. Y. Now they are back at Flint for rebuilding and more use. By the way, it is estimated that rebuilding will cost more than new machines would, but new ones are not available.

**C**OMPLETELY cleared is the main assembly plant operated by Chevrolet. Here the clearing out took one week, and restoring the plant to its previous condition will take at least six weeks, it is estimated, if equipment leased, loaned or sold can be quickly accumulated again. This indicates, in part at least, how complete is the disorganization to which the auto industry is now being subjected. A sudden decision to build a few hundred or a few thousand cars, even for some emergency use, would find the industry today unable to comply in anything less than months of time, executives have warned.

This Chevrolet plant will be tool-ed to build some product specified in a contract signed since Jan. 1, and the nature of the item is not being announced, but it is believed likely that it will make some special type of army vehicle, probably a heavily armored combat car.

A surprising feature of this tour through the industry is the fact that most of the preparations are being made to manufacture items which were not even contracted for on Dec. 7 last. Most of the contracts were in negotiation six, eight

or twelve months previous to that time, however.

Information supplied by Buick on a visit there includes the fact that the large area formerly used for shipping automobiles is to be used for machining and assembling transmissions and final drives for the Fisher tanks. Part of the Buick axle plant will be used also in this program.

Lumping together the Buick and Fisher tank employment figures indicates that a large part of the employees previously working on automobiles and bodies will find jobs on tanks.

In addition, other projects under way at Buick include parts for Pratt & Whitney engines, gun mounts, cartridge cases, diesel engine crankshafts, and projectiles. Chevrolet also will work on projectiles, as well as on military truck parts which will be shipped elsewhere for assembly.

In Detroit, Ford is readying an old plant for tank work, also has welding schools in operation, and announces that production can be expected in volume by early summer.

**A** SWEEPING and enlightening roundup of current activity in the industry was given last week before members of the Society of Automotive Engineers here by George Romney, managing director of the Automotive Council for War Production and Detroit manager of the Automobile Manufacturers Association. Speaking on "Automotive War Production Time Table," he said "Present contracts by the automobile industry translate into an annual production rate at peak of \$12,000,000,000, and the industry's undertakings are still being increased. The size of such a munitions industry is fantastic. It is three times bigger than the whole automobile industry in 1929, its biggest year. It is equivalent to producing 15,000,000 cars and trucks in one year."

Because of the size of the war program undertaken here, the slow turnover of money in war work, and similar factors, the industry faces the unusual prospect of seeking outside help in financing, maybe in the next year, according to an outstanding financial authority in the industry. His conclusions,

(CONTINUED ON PAGE 112)



# Your JOB IS *Our* JOB

. . . *now*, more than ever before!

**W**e're all working at the same bench, to answer the "Full Speed Ahead" signal. Your job is our job—*helping to make better tools that will increase production.*

Making tools that will produce more pieces in less time is a job that you and Carpenter can do *together*. Getting continuous production from machines and presses, with fewer interruptions for regrinding, repairing and replacing tools, is more than a one-man job.

Just as always, Carpenter's policy of help to tool steel users goes beyond the supplying of quality tool steels. Continuous production calls for good design, careful steel selection, expert tool making and exact heat treating procedure. Right there is where Carpenter can help you—with a *simplified* program for the proper selection and correct heat treatment of tool steel to do each job.

As a part of that program, we offer this handbook, "Tool Steel Simplified". It is being used in tool rooms, machine shops, and heat treating departments—to make *every* pound of tool steel

contribute its share to faster production. The chapter on "The Relation of Design to Heat Treatment" contains information that has already saved many hours and much valuable tool steel in many tool rooms. Three chapters on heat treating procedure make this handbook a particularly valuable reference source for the hardening room. "Tool Steel Simplified" helps train apprentices faster and is a good "refresher" course for tool makers.

Over 22,500 copies of "Tool Steel Simplified" are at work helping plants produce *better tools* that will do the work *more quickly*. It answers questions like these: *How to stop tools from warping? How to avoid grinding checks? How to make tools wear longer? How to prevent size change? How to be a trouble shooter?*

The price of "Tool Steel Simplified" is only \$1.00 postpaid in the United States—\$3.50 elsewhere. Send today for this aid to better tools and higher production. We believe that after you have read "Tool Steel Simplified", you will want more men in your plant to have copies of this book.

THE CARPENTER STEEL COMPANY  
Dept. 101 Reading, Pa.

**Carpenter**  
**MATCHED**  
**TOOL STEELS**

Over 22,500 Copies  
now in use

"TOOL STEEL SIMPLIFIED"  
by Frank R. Palmer  
Vice President  
The Carpenter Steel Company

315 pages—205 illustrations

\$1.00 postpaid in U. S. A.—\$3.50 elsewhere



# Washington . . .

• Henderson's opposition to wage boost seen reflecting change in administration attitude . . . Steel prices and anti-inflation efforts hinge on outcome of Little Steel and G-M wage discussions.



WASHINGTON — Whether justified or not, much significance has been given to the forthright statement made by Price Administrator Leon Henderson before the National War Labor Board and to a letter he addressed to the President flatly opposing "substantial" wage increases such as are being asked by the CIO.

Mr. Henderson's close association with the White House, reflective of his influence in the administration, explains why great weight is given to his attitude toward such wage demands as \$1 a day increase in "little steel" and General Motors.

Mr. Henderson, it was stated, was invited to appear before the board. This together with the fact that he took occasion also to present his views direct in a letter to the President gave rise to reports that his action was administration-inspired. There is no proof that this is true but if it is so that the administration pursued this course to express its war labor policy it definitely is a switch from its previous record of yielding to all demands of organized labor.

In any event regardless of whether Mr. Henderson was the selected medium to place the Administration policy on record, it bespeaks a courage on his part that few, if any others, in the administration have. Just why the board should seek advice from another

government source is a puzzling question not yet answered, since supposedly it is responsible for its own labor policy, including that governing wages and demands for the closed shop.

Mr. Henderson properly did not give his views respecting the closed shop, though it is even more important in the steel and General Motors cases than is the demand for a \$1 a day wage increase.

IT seems inconceivable that the Board will submit to either demand, yet it has a sour precedent for granting the closed shop. It has only to look to the artifice used in the steel captive coal mine cases to see how the trick was done, though it is to be earnestly hoped it never again will be used.

As was to be expected, both CIO and AFL leaders are represented as boiling over Mr. Henderson's opposition to "substantial" wage demands. His proposal to put a ceiling on wages—carefully omitted by the politicians from the price con-

**LATIN AMERICAN NEIGHBOR:** Arthur de Souza Costa, Minister of Finance for Brazil, was greeted by Undersecretary of State, Sumner Welles, as he arrived in Washington last week.

*Harris & Ewing Photo*



trol bill—is based on the same motive that governs the maximum prices which he fixes.

He wants to prevent inflation and if wages get out of hand inflation is just as certain as it is if prices get out of hand.

Mr. Henderson is about to discuss second quarter steel prices with steel executives. Clearly OPA intends to bar any general increase in such prices. Yet if he cannot assure the industry against such demands as SWOC is making it is equally clear that the lid cannot be kept on present maximum prices.

Hence, it is desirable for Mr. Henderson to go before the steel industry at least armed with the fact that he is on record against the \$1 a day wage increase. Should the price decision be made before the Board acts on the wage issue, it is to be presumed that any continued freezing of existing levels would be subject to adjustment made necessary by higher costs which would rise abruptly if a \$1 a day increase were sanctioned by the Board.

SUGGESTIONS have been made that the board will seek a compromise, allowing a portion of the increase asked. Though it is contended that the industry could not absorb such higher production costs without getting higher prices, reports have it that it might be asked to do just that.

Since the General Motors case now is immediately before the Board, it is hoped that a decision in it, being similar to the pending "little steel" case, will be made before the price conference is held with the steel industry, for it should afford a good yardstick not only for the steel industries but other large industries respecting the Government's war labor policy which inevitably will be governing factor regarding the price policy.

The "little steel" case plainly has been instituted by SWOC as a move to spread its demands, concerning both wages and the closed shop, to govern the entire industry. And if the key automotive and steel industries are subjected to organized labor domination then it follows that



**CASE "A"**

Reduction of 64% in  
man hours in one single  
operation

**CASE "B"**

Increase from 20 to 80  
tons of steel handled in  
one day

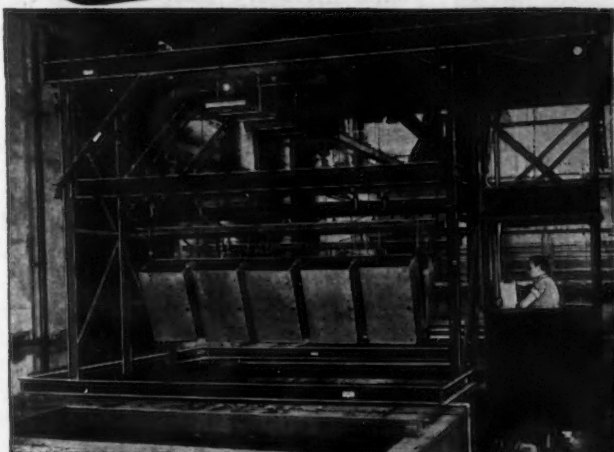
**CASE "C"**

Production increased  
**30%**

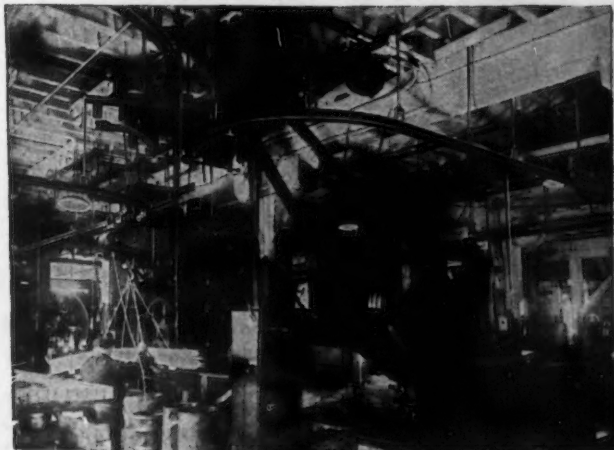
# HOW'S THIS FOR *Stepping Up* PRODUCTION?

**Y**OU, too, can accelerate your rate of production as rapidly as you release man-power from handling labor. Any mechanical means of lifting and carrying even light loads reduces fatigue and thereby makes possible a greater output per man.

This is only one of many advantages gained with American MonoRail Handling Systems . . . to mention a few others — reduction in idle machine time, more compact arrangement of machinery and equipment, congested operating conditions overcome, and waste space converted into profitable space. **BUT STEP UP PRODUCTION YOU MUST.** Let an American MonoRail engineer show you how it can be done in your plant. American MonoRail equipment is engineered to meet the particular requirements of each problem. There is no delay or shut down during installation.



Special crane handles multiple units through cleaning process.



Overhead tracks bring metal to machines in compact arrangement



Trucks unloaded in 1/3 former time.

## THE AMERICAN MONORAIL CO.

13103 ATHENS AVENUE

CLEVELAND, OHIO



Harris &amp; Ewing Photo

**NEW WAR LABOR BOARD:** President Roosevelt recently conferred with the newly created War Labor Board to assure effective participation of labor in the war effort. Those that attended the White House meeting are: Sidney Hillman, OPM and former CIO official; R. J. Thomas, UAW; William Green, AFL president; Mrs. Anna Rosenberg; Philip Murray, CIO president; Julius Emspak, United Electrical Workers; George Meany, AFL secretary-treasurer; and Daniel Tobin, AFL vice president. This board will sit periodically with the President in an advisory and planning capacity.

all other large as well as many small industries will likewise fall under its control.

**A**ND if that happens, Mr. Henderson may as well surrender to "General Inflation" with an ensuing havoc that would be even more disastrous as an immediate prospect than are the extremely serious war dangers now confront-

ing the country. It would be a tragic commentary on the pious lip service given by organized labor that it will fully support the war effort.

Unlike his reported flat opposition to "substantial" wage increases for groups that are already well paid, Mr. Henderson is said to have made another suggestion that is the source of widespread disapproval.

He is said to have told the board that where wage increases are found necessary their inflationary effect might be avoided if they were paid in savings stamps or defense bonds. For one thing it has been pointed out this would increase costs of some producers who could not afford to pay them in the absence of higher prices, which would be inflationary in their result.

"Sterilization" of wages by this method hardly seems practical either since the stamps and bonds could be discounted and converted into cash, meaning greater purchasing power, which Mr. Henderson wants to check.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS



## Ickes Proposes Plan To Fill U. S. Ore Needs

Washington

... A program for the large-scale development of untapped and low-grade manganese and other metallic ores, designed to make the United States independent of foreign minerals, was laid before the Senate last week by Secretary of the Interior, Harold L. Ickes. The Department of Interior's proposal was submitted at the request of Senator Joseph C. O'Mahoney, of Wyoming, Chairman of the sub-committee that has been investigating the use of resources in the western states.

In addition to claiming that the program would make the United States self-contained with respect to ore requirements, it is contend-



ed that the program would save millions of tons of shipping, possibly the use of Navy vessels for convoy, and also look toward the rounded development of the west.

The program includes 17 sample power projects in 12 states, which, it is claimed, will provide 10,000,000,000 kw-hr. of energy annually. The multi-point resources program provides for financing mineral and industrial development, "avoiding monopolization" and the development of additional power facilities to meet war needs and subsequently peace needs, the Department said.

Much of the exploratory work that must be done, it was recommended, should be handled through the Bureau of Mines and the Geological Survey. Included in the report were recommendations that Congress appropriate sufficient funds for both the exploratory and development work, and the actual construction of such mines, power projects, mills, and smelters into operation.

#### H. S. Sloan Made Advisor To OPA Consumer Division

Washington

•••Harold S. Sloan, executive director of the Alfred P. Sloan Foundation, has been appointed as an advisor to the Consumer Division of the Office of Price Administration. Dr. James E. Mendenhall, educational director of the Institute for Consumer Education, Stephens College, Columbia, Mo., has also been appointed to the Consumer Division staff, to direct the work of program planning and program materials, a Consumer Division service to civic, educational and consumer organizations interested in a war time consumer program.



#### MacPherson Appointed

Washington

•••James MacPherson, of Larkspur, Cal., has been appointed as Deputy Director of WPB, assigned to the Procurement Division of the Treasury Department. At Treasury Procurement, Mr. MacPherson will represent the Division of Purchases of WPB in handling lend-lease purchases.

## Use the VISUAL GAGE for the Precision Checking of

- 1 Width and Thickness
- 2 Height and Depth
- 3 Outside Diameter
- 4 Inside Diameter, Taper, Out-of-Round, Bell Mouth
- 5 Pitch Diameter of Screw Threads
- 6 Angularity of Surfaces or Between a Bore and a Surface
- 7 Run-out of a Roller with Respect to an Eccentric Axis
- 8 Parallelism of Surfaces or Edges
- 9 Two Dimensions Simultaneously



Suited to Routine Work of the  
Tool Room • Production Shop  
Inspection Department • Laboratory • Receiving Department  
MAGNIFICATIONS: 10,000, 5,000, 2,000, 1,000 and 500 to 1  
ALL MEASUREMENTS REFERRED TO PRECISION GAGE BLOCKS

THE SHEFFIELD  
CORPORATION

Formerly—The Sheffield Gage Corp.

Gage Division • DAYTON, OHIO, U.S.A.



# WEST COAST . . .

• War Clinic includes many items shipped from other parts of country . . . Coast already looks to new markets across Pacific to be developed after war ends.



**S**AN FRANCISCO — Originally planned to promote contracts and sub-contracts for small manufacturers, San Francisco's "War Clinic" sponsored by the Contract Distribution branch of the WPB now also includes many articles ordinarily shipped to the Pacific Coast from other parts of the country.

Because some Eastern manufacturers have displayed a tendency to take care of customers nearest home, the far West has suffered in its ability to obtain delivery of many industrial lines. Some manufacturers have withdrawn their West Coast representation entirely. Most manufacturers with little to give to the non-defense trade, however, have rationed available supplies among territories previously served with the aim of maintaining a foundation for a post war market.

The jobbers exhibiting at the San Francisco War Clinic in the hopes that prominent facilities will be developed in the West for future needs, represent varied fields. Included are George C. Boardman, marine supplies; Dunham, Carri-gan & Hayden, tools, hardware; C. W. Marwedel, tools and builders' hardware; Johnson & Joseph Co., ship chandlers; and Weeks, Howe, Emerson Co., ship chandlers.

**I**F Pacific Coast manufacturers are able to produce at competitive prices, the war offers an opportunity for them to capture a market that they need never lose. They may even share, because of their location on the seaboard, with a growing South American trade that need not be taken away from them at the end of hostilities. Further, an eventual allied victory in the Far East will place them in a geographical location far better than the East to serve vast new markets across the Pacific. There is no doubt, and has been no doubt for years as to the industrial potentialities of this region. The trick is to guess whether it will be a few or many years before they are fulfilled.

Trade with colonial possessions in the Far East cut off from European sources has been sharply curtailed since the involvement of the United States and threatens to vanish entirely for the time being. Loss of the Philippines, particularly, meant the end of a substantial steel export business from Coast ports.

Although Americans may regard this market as permanently lost, the Chinese are not so easily discouraged. Prospective agents in China for American steel companies have been active on the Pacific Coast attempting to make mill connections to become effective when the war is won.

This may well be an indication that, with the rebirth of the Chinese nation, that steel going to China after the end of the war will come from small as well as large American mills.

**D**EPARTING from this practical to a purely conjectural analysis, it is interesting to note exactly what the Japanese would gain industrially should the Pacific Coast States of this country fall into their hands. They would gain somewhat over 1 per cent of our national steel capacity, but, unless they got as far as Utah, would have no corresponding pig iron capacity with which to operate it. Since they have done a good job of stripping us of scrap iron and steel prior to the war, they would have to dig hard for scrap. They would gain some of America's largest aircraft

factories, but unless they built plywood planes, would not have the raw materials with which to operate them. If they could obtain the necessary ore elsewhere, they could use the aluminum reduction plants, but would have no rolling mill in which to roll sheets for aircraft. They would gain an agricultural empire, but would have to bring their power machinery from Japan and, if the retreating Americans did a good demolition job would find many of their fields scorched for want of irrigation water. And, unless they were able to obtain all facilities intact for an average distance of 200 miles inland, they would not obtain any water and power facilities with which to operate their Coast establishment. This is not written with the idea that Japan has even a remote chance of being able to carry out such a conquest, but to point out the utter dependency of this Coast upon other parts of the country until some expansion is made of basic production elements required by its industry.

Nine months has passed since W. A. Hauck, steel consultant of the OPM, recommended that certain expansion of West Coast steel facilities be made to make this Coast substantially independent of Eastern mills for its steel supply. This expansion, in the words of a later report, was to be made for "strategic and economic reasons as well as to effect some decentralization of the steel industry westward." Following a second report Sept. 24, the bulk of the pig iron capacity recommended actually was approved for financing, together with sufficient open hearths and finishing mills to produce the steel plate tonnage contemplated under the program, plus some surplus ingot capacity. This capacity is actually being constructed by Columbia Steel Co., United States Steel Corp. subsidiary, at Provo, Utah. No action has been announced, however, on nearly the entire balance of both ingot capacity and finishing facilities embodied in the West Coast steel expansion proposal. Mr. Hauck's report estimated that the national increase in capacity could be completed within from nine months to two years. In other words about one-third of the West



# DEFENSE STRATEGY



● Making adequate service immediately available at the most important centers, is "Defense Strategy" because it helps to insure American industry's ability to produce more . . . faster. That's why the Twin Disc Clutch Company has continued to expand its service facilities until now they have:

**7 factory-controlled branches** manned by fully equipped field engineers ready to assist and advise you on any clutch or hydraulic drive problem.

**30 parts and service stations**, with competent help ready . . . will help you to prevent shut-downs or serious delays due to unforeseen accident or the breakage of any clutch part.

**This extra protection** is yours when you specify "Twin Disc Clutches." **TWIN DISC CLUTCH COMPANY**, 1370 Racine Street, Racine, Wisconsin.

**TWIN DISC**  
CLUTCHES AND HYDRAULIC DRIVES

REG. U. S. PAT. OFF.

Coast expansion program has been "under consideration" for a period of time which could have seen it well on its way toward completion. As nearly as can be determined from details which have been made public, the entire question of West Coast capacity has been bounced around because, in the case of pig iron, the question was being mulled as to whether new furnaces should be built or old ones reassembled in the West; because available raw materials were far from ideal; and because the military branches could not make up their minds at what location on the Coast they wanted the capacity built. Meanwhile, the Pacific Coast is a steel "orphan," forced to depend almost entirely upon Eastern mills, and forced to bring its tonnage all-rail across the continent because of the withdrawal of ships in the Panama Canal service.

**I**N the meantime, also, the tendency toward scrap shortage has become so strong that serious

consideration must be given as to whether or not to build additional Western pig iron capacity to keep present facilities operating.

The delay in expanding aluminum production has been almost as bad. With aluminum, however, an extenuating circumstance has been the constant increase in estimated requirements to carry out a growing aircraft program. There is no excuse, however, for time consumed in kicking around aluminum plants from one Coast location to another and the apparent failure to correlate reduction capacity with finishing capacity.

To a certain extent, Coast defense industries can go on bringing its raw materials from the East, but each time another billion dollars worth of aircraft or shipbuilding contract is awarded, the burden on the railroads increases. Eventually the time will come when the railroads can carry no more, and no further industrial expansion can be made without corresponding raw material production capacity.

eral methods, the war will be won, and not otherwise."

He voiced the possibility that the old role of prices and profits will never return: "Unless American industry proves itself in the immediate task of turning out the implements of war, it will probably have no place in the society of the near future . . . your future status will depend on how you produce now."

This view drew fire from Herbert S. Simpson, president of the American Foundrymen's Association, in a later address.

"Industry must carry the load, but there is a responsibility on government also, and industry should hold government responsible for doing its job, providing industry cooperates. This is a war of production and in conducting this war industry and government must work together," Mr. Simpson declared.

Mills hoping to make steel deliveries to non-essential civilian industries will not come within three million tons of their objective, Dr. Samuel S. Stratton, chief of the technical consultant staff, WPB Division of Industry Operations, told the Californians.

The Army, Navy, and Maritime Commission will require nearly 20 million net tons or 24 per cent of the probable total steel ingot production in 1942, estimates quoted by Dr. Stratton indicate. This compares with eight million tons in 1941. The WPB estimates that foreign requirements plus construction requirements connected with the war effort will take 32 million net tons in 1942.

This total of 52 million net tons of ingots required for war and defense industry this year equals the entire 1939 production and the 1936-40 five year average. It is 97 per cent of 1937 production.

In addition to these direct needs of the war program, essential civilian industry, such as agriculture, machine tools, petroleum, mining, transportation, will require 34 million tons. Thus, estimated production of about 83 million tons will fall about three million tons short of direct military and essential civilian requirements.

Dr. Stratton defined the objective (CONTINUED ON PAGE 112)

### Price Factor No Stimulant, Meeting at Del Monte Told

• • • American industrial production can't be stimulated by increased prices; capacity steel operation will be far short by three million tons of ingots of filling direct military and essential civilian needs for 1942.

This was the twin message brought by WPB and OPA officials to the eighteenth annual conference of California Iron, Steel & Allied Industries here last week.

Price and profit have no function in regulating production in total war, Roswell Whitman, chief of OPA's Iron and Steel Products Division, told the conference.

"If the government is to direct all production, and it surely is, then the role of prices and profits in this regard is antiquated. There is no need, then, to let prices go up to get production—other methods are better."

Mr. Whitman pointed to the weakness of price as a stimulus to production as demonstrated by the first World War.

"Prices kept on rising long after production had reached its peak.

The memories and results of that inflation are still with us. It must not reoccur."

Further use of price to bring in marginal scrap, with a differential price schedule drawn along lines similar to that of copper, is still being considered, however, Mr. Whitman indicated. With present scrap schedule prices at a level of 35 per cent over 1939, effectiveness of blanket price rises would be nil, and the "directive technique" is now the dominant market trend, he said.

Limited use of price as a production stimulant will be increased in the farm field and in certain other industrial fields where profits and inflation would not result.

Profit will be allowed only as a reward for efficient production if the OPA's philosophy is carried out, according to Mr. Whitman, and individual price ceilings will not be set to allow inefficient producers a guaranteed profit.

Declaring that a government dominated industrial economy was inevitable in modern warfare, Mr. Whitman said, "Unfortunately Hitler brought it to near perfection. If American genius for production can be added to his gen-

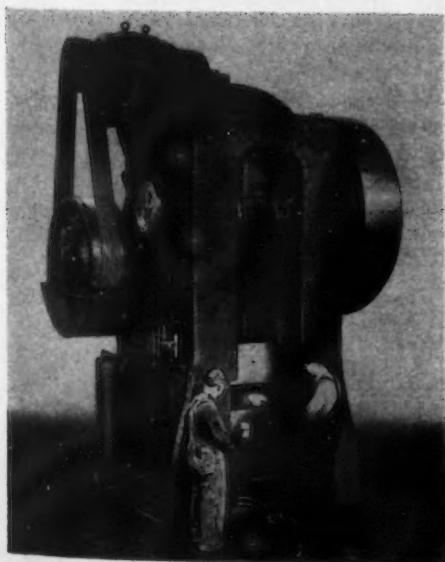


# AJAX ONE-PIECE SOLID STEEL PRESS FRAME

**Has Maximum Rigidity—  
Indispensable in  
Producing  
Close-Tolerance  
Press Forgings**



★ BUY FORGING EQUIPMENT ON THE  
BASIS OF MECHANICAL SOUNDNESS ★



- **THE AJAX ONE-PIECE, SOLID STEEL PRESS FRAME** has massive cross section of metal for extremely low stress and minimum elongation rated tonnage.
- **COLUMNS** are solid steel of ample cross sectional area with no deceptive coring.
- **CROWN RIB** of large proportion prevents deflection of eccentric shaft journals.
- **DIE SEAT** is deep ribbed for greater stiffness.
- **RESULT — CLOSE-TOLERANCE FORGINGS** with **MAXIMUM DIE LIFE**. Capacities 500 to 2500 tons. For further information write for Bulletin No. 75.

THE **AJAX** MANUFACTURING COMPANY  
EUCLID BRANCH P. O. CLEVELAND, OHIO  
621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

# Fatigue Cracks

BY A. H. DIX

## Bull's-Eye

• • • A potshot at the title of this page is taken by our contemporary, "Marksman," who writes a column called "Random Shots" in the *English Foundry Trade Journal*. He reports a conversation between father and son concerning the meaning of "Fatigue Cracks." The son is puzzled, and the father explains the *double-entendre*. The son then wisecracks, "Or, alternatively, perhaps it means jokes that make you tired."

We are sensitive about the title and have often wondered whether we made the right choice. When a name for this page was under consideration the suggestions were narrowed down to six. Among the other five, as we recall them, were "Hits and Misses," "Chips," and "This and That." The other two were equally dreary. "Fatigue Cracks" was adopted as the least of six evils.

At the time we were conscious of the title's shortcomings and hoped that the passing years would mellow it, so that eventually, like the wart on the nose of a friend, it would be taken for granted. But if "Marksman" persists in keeping the wound open we will cook up a conversation of our own between a father and an acid-tongued brat barely above the draft age, who says, "But, daddy, wouldn't 'Random Misses' be better?"

## Winner and New Champion

• • • Until last Monday morning we would have yielded to no one in appreciation of the brains department's work, but this leaves us gasping:

As a new subscriber to *Iron Age* I wish to know why on earth you let our Company go so long without insisting that we take your publication? Frankly though, I will admit you sent us enough circulars that we should have realized what we had been missing. AND I sent you an order just in order to be rid of them, never dreaming what a wealth of reading and information I was to receive.

Now, on Friday morning when *The Iron Age* arrives I hang a sign on my office door reading, "Silence! Genius at Work," and settle down with a sigh of satisfaction to enjoy an hour or two of profitable reading.

—Hah B. Moon, General Manager,  
Moon Welding and Machine Co., Kokomo, Ind.

We feel like the widow who listened open-mouthed to a eulogy of her dead spouse and finally whispered to her son, "Danny, go up and see if that's your father there in the coffin."

## Poem

• • • Then there are those whose admiration for your favorite family journal causes them to become lyrical. We found this scribbled at the bottom of a subscription bill sent back to us with a check for \$6 by Charles G. Fallon of Jamaica Plain, Mass.:

The f.f.j.  
It be O.K.

## Banner For Brains Dept.

• • • As you know, those who do good work on jobs for the Navy get a banner with a big "E" for excellence on it. We hear that it is an effective production booster. We think it would be nice if the War Production Board got out something of this kind for the trade press and other information sources. They could start things off right by giving the brains department an "E" for enterprise for the priority guides and the manual of OPA price ceilings. Both are extracurricular activities, and although both have been amply praised by industry and the guvment, like the old maid we just like to talk about them.

Incidentally, extra copies of the price manual can be obtained at the same prices as apply to the priority guide: 25c. each for 1 to 10; 20c. for 11 to 100; 18c. for 101 to 300, and 15c. each for larger quantities.

## Slogans

• • • Recently we quoted the slogan coined by Ambrose Harle of the Savanna, Ill., Proving Ground, and approved by the War Department—"The man who relaxes is helping the axis." We praised the slogan's swing but said it was unsound psychologically because failure to relax at intervals ruins the stomach and the nervous system.

An anonymous Baltimorean who signs himself "Norvic" offers as a sounder variant, "The man who slacks is helping the axis." Better in one respect, but the first half is shy a foot, spoiling the swing. This is perfect, "The man who is lax is helping the axis."

## Lowdown on High Bridge

• • • Maybe you noticed that the newspapers recently announced the death of "The Voice of Experience," by name F. Marion Sayles, who made a more than comfortable living by combing the snarls out of tangled lives over the radio.

Occasionally the Voice departed from his mission and took time off to view with alarm. Years ago, for example, he announced over the air in a don't-let-this-go-any-further tone that he had been told confidentially the George Washington Bridge was unsafe, because it was constructed of steel made half of scrap.

## Apt Head

• • • A pat on the back of the *Printers' Ink* headline writer who wrote this:

New Food Trends Forming as Cannors  
Await Tin Commandments

## Stopper

• • • Wanted: One Gypsy on Our Payroll!—Peter A. Frasse & Co.

## Right Man for the Job

• • • Did you notice from the directory of OPA officials on the last page of the price manual you got with last week's issue that C. W. Nichols is in charge of OPA's Nickel and Nickel Scrap Division?

## Running Start

• • • Ben Corrado, your Cleveland newsgatherer, heard Tell Berna, general manager of the National Machine Tool Builders Assn.:

Three bar flies were bragging of their athletic prowess when they were in their prime. "I could swim three miles and think nothing of it," said the first. "That's nothing," said the second, "I used to run five miles without even getting winded." "Five miles!" said the third. "Why, there was a time when I could run 15 miles to my house and when I got there I'd jump over it."

Number 1 merely yawned and said, "No wonder. Look at the start you got." While his audience was guffawing Tell delivered the snapper, "And so, now that the machine tool industry has run 15 miles, we have been asked to jump over the house."

## Puzzles

Take 1 1/7 gallons out of last week's radiator.

This will take your mind off the war:

Helen and her youngest daughter Joan have been spending Christmas with me. I had not seen Joan for more than two years, when she scolded me for giving her the same birthday present for two years running.

Joan and her sister go to school with my daughter Julia. But Julia will be leaving soon, as she will attain the school's age limit of 14.

Every Christmas Helen puts by money for her children. She multiplies together the ages last birthday of the children and the product thus arrived at is the number of shillings she puts by. "It must be quite a tidy sum this year," I said. "Well," she replied, "it grows. It's £30 more than the check I wrote out when we were staying with you last." How old is Joan?



### Rebirth of Alchemy: Copper from Tin Cans

••• Quoting a release from WPB, "the process whereby (tin) cans are actually converted into copper is not new," brings to mind some stories of transmutation of metals, or alchemy, of a bygone age. While the leaching process of recovering copper from copper bearing waste liquors is not new, WPB at least puts a new angle on it by stating that the tin cans used in the process actually become copper.

What really occurs is that the copper in copper bearing waste liquors directed into settling tanks containing iron (under the tin coating in tin cans) precipitates out of the solution, forming a reddish mud, high in copper, known as cement copper. When this mud is refined, either electrolytically or by smelting, comparatively pure copper is obtained.

The iron, on the other hand, dissolves, and is carried away in the waste solution.

### Buffalo Ore Needs for '42 Put at 8,500,000 Tons

Buffalo

••• With a new blast furnace now under construction at the Lackawanna plant of the Bethlehem Steel Co., more than 8,500,000 tons of iron ore will be needed to keep this area's 16 blast furnaces going at record capacity this year. That is 1,500,000 tons more than came down the lakes to this port's ore docks in 1941. Marine men said this week every available ore-carrying vessel, and very likely some grain and coal boats, will be pressed into service for the expected record movement of ore to this and other lower lake ports this year.

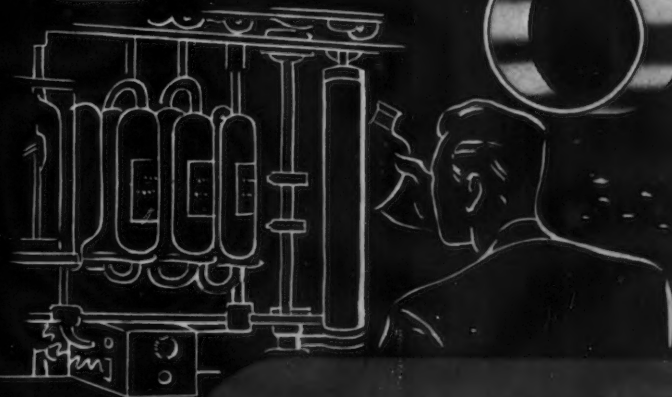
### WPB Names Typewriter Group Washington

••• WPB's Bureau of Industry Advisory Committees announced on Feb. 5 the formation of a Typewriter Manufacturing Industry Advisory Committee. Members are:

M. V. Miller, Royal Typewriter Co., New York; B. O. Reuther, Remington Rand, Inc., Buffalo; L. C. Stowell, Underwood Elliott Fisher Co., New York; V. H. Davidson, L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y.; Major F. W. Nichol, International Business Machines Corp., New York; and J. Sears, Woodstock Typewriter Co., Woodstock, Ill.

# Speed Your "All Out" Production with

# Thomastrip



**LABORATORY TESTED  
TO SPECIFICATIONS**

**BRIGHT FINISH  
NOT COATED,  
HOT TIN COATED,  
ELECTRO COATED  
WITH NICKEL OR  
ZINC, COPPER,  
BRASS . . . . .**

• Thomastrip is a specialized product made accurately to specification, meeting the most rigid requirements and accelerating production for those making defense parts. Laboratory tests in addition to broad experience and specialization in cold rolling of the most exacting nature enable Thomas to meet these demands. Send sketches, drawings, or write regarding your "all out" products.

**THE THOMAS STEEL CO., WARREN, OHIO**  
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

# Dear Editor:

## BACK COPIES

Sir:

We have an accumulation of IRON AGES from 1906 to date. Are these of any value or would you suggest that we sell them for waste paper?

HAYES TRACK APPLIANCE CO.  
Richmond, Ind.

Sir:

We have been requested to furnish a price on your publication for the years 1937 to 1941 inclusive. Please advise us in regard to your ability to furnish these numbers and our cost mailed to Willow Run, Mich.

P. F. SCHAFFER

Moore-Cottrell Subscription Agencies  
North Cohocton, N. Y.

• Our own stocks of back issues are spotty and we are rarely able to supply a complete file for even a single year, but we are always glad to introduce sellers to buyers.—Ed.

## CENTERLESS GRINDER

Sir:

We are interested in purchasing a centerless grinder. Will you please furnish us with some names and addresses of manufacturers of this machine?

W. ZEUS

National Tool & Die Co.  
Kenilworth, N. J.

• Only maker in U. S. is Cincinnati Milling Machine & Cincinnati Grinders, Inc.—Ed.

## MR. BLAH IN DEMAND

Sir:

We are very much interested in the cartoon, "Mr. Blah Gets His Weekly Scrap Allocation," on page 78 of the Jan. 1 issue. Would you have any objection to our reproducing it in the *Link-Belt News* with a credit line?

R. B. KERN, Editor

Link-Belt Co.  
Chicago

• Permission granted.—Ed.

## MACHINE SHOP COSTS

Sir:

I noticed in your "Dear Editor" page the request of the Manco Mfg. Co., Bradley, Ill., for a Chicago publication "for use in estimating individual operations in a machine shop."

This may perhaps be the following: *New-method Estimators' Handbook*; a book of practical time-saving tables. 1095 p. 1936. \$15. Compiled by L. E. Almgren and Michael Wurum.

The publisher is the New-Method Engineering Corp., 4753 Broadway, Chicago. The name of this company does not appear in the current telephone directory of Chicago, but the book can probably be obtained from

some dealer who specializes in out-of-the-way books, perhaps C. V. Ritter, 58 E. Washington St., Chicago. . . . I am sending a copy of this letter to Manco.

E. H. McCLELLAND

Carnegie Library  
Pittsburgh

## FLAME SCARFING

Sir:

Some time ago you ran an article on the flame scarfing of steel with hydrogen. I wonder if you would be kind enough to send me the name of the manufacturer of the equipment and gas used in this operation.

G. H. SLAGLE

Beryllium Corp.  
Reading, Pa.

• We do not recall a description of flame scarfing with hydrogen, but two companies manufacture both equipment and gas for flame scarfing with oxy-acetylene—Linde Air Products Co., 30 E. 42nd St., New York, and Air Reduction Sales Co., 60 E. 42nd St., New York. See *THE IRON AGE*, Oct. 13, 1938, p. 40, and Oct. 5, 1939, p. 5.—Ed.

## LOW MELTING ALLOY

Sir:

In March 6, 1941, issue of *THE IRON AGE*, there is an article on a "Simplified Shell Lathe." They use a low melting point casting metal on this lathe to hold the bearing in place. Can you tell me where I can obtain such a metal . . . ?

WALTER F. GROVES

Wichita, Kansas

• The material you refer to is what is known as a matrix alloy, containing bismuth, lead, tin and antimony. Its melting point is about 250 deg. F. General Electric Co. developed the material used in the lathe you mention. Cerro de Pasco Copper Corp., 40 Wall Street, New York, makes a similar material.—Ed.

## RECLAIMED OIL

Sir:

Several years ago we believe you published an article covering the lubricating qualities of reclaimed lubricating oil. If this treatise is available, kindly advise how we may obtain it.

J. PAUL LAIRD

Wicaco Machine Corp.  
Philadelphia

• Don't believe we've published such material over past six or seven years, but in May, 1938, we did illustrate a unit, for reclaiming crankcase and industrial oils, made by Bucyrus-Erie Co., South Milwaukee, Wis. Suggest you get in touch with B.-E.—Ed.

## PRICE SECTION

Sir:

Could you let us have three additional copies of the Price Section supplied with the Feb. 9 issue? We will be pleased to remit if there is any charge.

D. A. CHEYETTE

Crusher Division  
Nordberg Mfg. Co., Milwaukee

• Extra copies are available at these prices: 1 to 10 copies, 25c. each; 11 to 100, 20c.; 101 to 300, 18c., and 300 or more, 15c. each.—Ed.

## SHRINKAGE CAUSE

Sir:

. . . Recently a gang of foundrymen were discussing shrinkage problems in marine castings, at lunch. Most of the problems had solutions, but not this one. Perhaps some of the readers of *THE IRON AGE* have had experience in this matter and might offer some suggestions.

The cupola charge consists of 500 lb. pig, 250 lb. steel rails and 250 lb. auto engines and other cast scrap. Castings made with this mixture shrink to a degree that makes the castings useless. Large sink heads on the mold are almost drained and the castings shrink even with churning.

An analysis of one of the defective castings is: 1.50 silicon; 0.10 sulphur; 0.376 phosphorus; 0.55 manganese, and 2.78 carbon.

What is causing this shrinkage? Can any of your readers spot the difficulty?

FOUNDRYMAN

• If any reader has a suggestion, we'd be glad to forward it.—Ed.

## COOK AND GLAMOUR GIRL

Sir:

Could you send me a couple of tear sheets of the Feb. 12 editorial, "The Cook and the Glamour Girl?" Cf. the young lady's definition of bolt and nut, "A bolt is a stick thing, with a bunch on one end and some scratches wrapped around the other end. A nut is the same only the bunch is broken off and the scratches are inside it."

J. M. PLUMMER

Leeds & Northrup Co.  
Philadelphia, Pa.

Sir:

I haven't seen anything funnier than "The Cook and the Glamour Girl" (should have been Chorus, for euphony, but I suppose you didn't want to insult the second oldest profession in the world) Girl" in longer than I can remember. . . . I'd like to see the "minor machine" which hammers steel into bars. . . .

A. W. MILLER

• The demand for copies of editorial, "The Cook and the Glamour Girl," has necessitated reprinting. Copies are available upon request.—Ed.



three addi-  
ction sup-  
We will  
re is any  
EYETTE

kee  
at these  
ach; 11 to  
nd 300 or

ndrymen  
problems  
Most of  
but not  
the read-  
had ex-  
night of-

s of 500  
d 250 lb.  
st scrap.  
mixture  
akes the  
k heads  
ined and  
h churn-

defective  
sulphur;  
nganese,

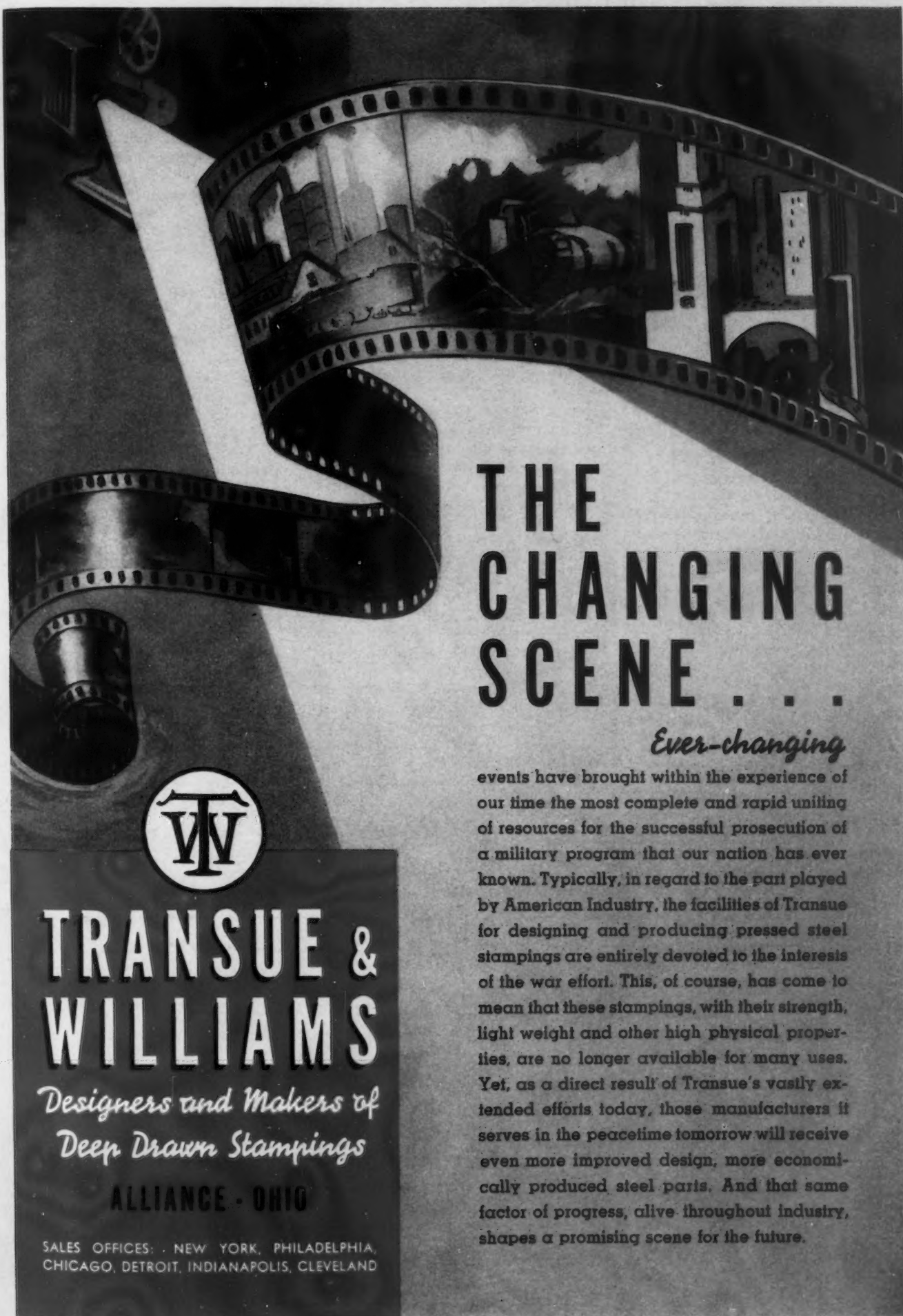
rinkage?  
the dif-  
RYMAN  
ion, we'd

GIRL

of tear  
al, "The  
Cf. the  
and nut,  
a bunch  
s wrap-  
nut is  
oken off  
"  
MMER

funnier  
lamour  
for eu-  
't want  
fession  
than I  
see the  
rs steel  
ILLER


itorial,  
l," has  
es are



# THE CHANGING SCENE . . .

*Ever-changing*

events have brought within the experience of our time the most complete and rapid uniting of resources for the successful prosecution of a military program that our nation has ever known. Typically, in regard to the part played by American Industry, the facilities of Transue for designing and producing pressed steel stampings are entirely devoted to the interests of the war effort. This, of course, has come to mean that these stampings, with their strength, light weight and other high physical properties, are no longer available for many uses. Yet, as a direct result of Transue's vastly extended efforts today, those manufacturers it serves in the peacetime tomorrow will receive even more improved design, more economically produced steel parts. And that same factor of progress, alive throughout industry, shapes a promising scene for the future.



## TRANSUE & WILLIAMS

*Designers and Makers of  
Deep Drawn Stampings*

**ALLIANCE - OHIO**

SALES OFFICES: NEW YORK, PHILADELPHIA,  
CHICAGO, DETROIT, INDIANAPOLIS, CLEVELAND

# This Industrial Week . . .

NEW efforts are being made at Washington to show industry and the public that the war against Germany and Japan can be lost or, at the very least, stalemated into an intolerable draw, unless drastic steps to lift arms production to an overwhelming level are quickly and forcefully taken.

So far, production in U. S. plants, however great, has been far from overwhelming, and British figures released this week on the totals of warplanes and tanks shipped to Britain by the U. S. in 1941 were disappointingly small.

Subdued by his inside knowledge of the width of the gap between what American plants are producing now and what this nation and its allies need in planes, ships, tanks, guns and other war implements, Donald M. Nelson cheerlessly told business paper editors a few days ago that the country is running short of time.

## Production Good But Inadequate

"There is a very substantial production; a very remarkable job has been done but it is woefully inadequate," said Nelson. "It isn't anywhere near enough." The WPB chairman declared that U. S. industry has been "lazy" on the subject of subcontracting and said that owners of idle machines must hunt for business rather than wait for war orders to come to them. We have lost a lot of time because industry would not expand through fears of what would happen after the war, he said. The "golden months" in which we could have expanded the steel industry and other industries have gone, he said, but we still have the "silver months" in which we can produce what we need.

To observers who had heard Mr. Nelson talk at other times on the need of stimulating war goods production, it was clear that the war program has reached the place where few new plants will be

built, and that emphasis will hereafter be placed on getting maximum production out of plants now producing war implements and converting civilian production plants by the thousands for war use. There is not a prime contractor in the country who can do more than he is doing now by subcontracting part of his work, the WPB chairman said.

## Plants Get New Insight Into Task

Meanwhile many metalworking plants are getting a better idea of how they can fit into the war program and thus are better able to foresee the situation they will be in six months hence. In some industries, the largest producers, equipped to make war products and diversified so that restrictions on some of their peacetime lines would not deal them a vital blow, will find themselves confined almost entirely to war products. Middle-sized companies in the same industry, less diversified and highly vulnerable to priority restrictions on output of their principal peacetime products, may be placed entirely on essential civilian products. The smallest units in the same industry may have to accelerate their efforts to become parts makers of war implements.

Since industry analysts seeking

to determine whether U. S. industry is doing a good or a somewhat less than adequate job should weigh all the facts, the latest figures on the nation's steel capacity are significant. The annual steel producing capacity of this country was increased during 1941 by 4,418,000 tons to a new record total of 88,570,000 tons, according to the American Iron & Steel Institute. The increase in the last six months of 1941 was 2,421,000 tons.

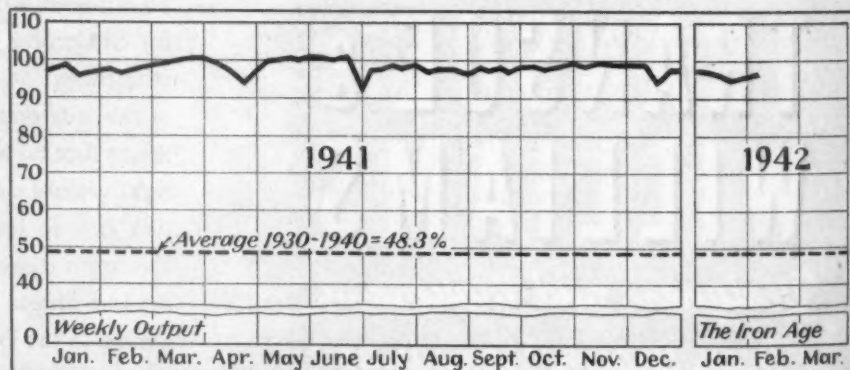
Last year's increase in steel capacity in the U. S. was slightly more than half Japan's total capacity, a development which may grow clearer to enemies of the U. S. as the war goes on.

Steel output this week touched a new high, exceeding the previous record established in early November of last year by a half point. Thus steel plants in the U. S. reacted to Singapore's fall and other bad news from world war fronts. Steel output for the week was 98.5 per cent, a gain of a point over last week's rate and a half point above the previous peak of early November, 1941. Operations this week on the basis of the new capacity data (published elsewhere in this issue in detail) equal 95.5 per cent of capacity.

Operating increases in various steel areas are small and scattered. Pittsburgh is unchanged at 97 per cent while the Chicago rate is up

Steel Ingot Production—Per Cent of Capacity

(Open Hearth, Bessemer and Electric Ingots)



Steel Ingot Production, by Districts—Per Cent of Capacity

	Pitts-	Chi-	Youngs-	Phila-	Cleve-	Buf-	Wheel-	De-	South-	S.Ohio	West-	St.	East-	Aggre-
	burgh	cago	town	delphia	land	falo	ing	troit	ern	River	ern	Louis	ern	gate
Current Week	97.0	104.0	95.0	91.0	98.0	90.0	88.0	101.0	99.0	98.0	97.0	81.0	113.0	95.5*
Previous Week	97.0	102.5	97.0	90.5	95.0	90.0	88.0	107.5	99.0	105.0	97.0	81.0	105.0	94.5*

\* Computed on new capacity data.



1½ points to 104 per cent. The Philadelphia district rate rose a half point to 91 per cent and Cleveland gained three points to 98 per cent. Roungetown dropped two points to 05 per cent. Buffalo was unchanged at 90 per cent and Wheeling held at 88 per cent. The south Ohio River plants eased seven points to 98 per cent and the eastern mills gained eight points to 113 per cent. (These district rates are calculated on the basis of the old capacity data and revised rates, using the new capacity data, will be published in next week's IRON AGE.)

### Corp. Shipments Set Record

January shipments of finished steel products by U. S. Steel Corp. subsidiaries were the highest for that month in the corporation's history, totaling 1,738,893 net tons, a total which was, however, a decrease of 107,143 tons from December. Industry-wide output of open-hearth Bessemer and electric furnace ingots and castings in January set a new high for that month and was the fourth heaviest for any month on record at 7,129,351 net tons. Steel production in January, 1941, was 6,928,085 tons. January's operating rate for the entire industry averaged 94.7 per cent of capacity, based on the revised ingot capacity of Jan. 1, the American Iron & Steel Institute reports.

### Ore Consumption Over 7 Million Tons

Although final reports are not yet completed, it is estimated that some 7,100,000 tons of Lake Superior iron ore were consumed in January, 1942, as compared with 6,331,018 gross tons in the corresponding month of 1941. January consumption apparently broke all previously existing records, including the one set in December, 1941, when 7,061,981 gross tons were used. Estimated January stocks of iron ore at furnaces in the U. S. were approximately 27,225,000 tons.

A factor in the current improvement in the steel melting rate is the more vigorous effort by scrap dealers and the mills to increase the flow of scrap despite bad weather in some areas. Government seizures of automobile graveyards in various areas are expected shortly. Last

week the country was divided into sectors for supervision of the auto graveyard program. The Office of Price Administration has drawn "timetables" outlining its various steps against uncooperative auto wreckers. Definite offers will be made within 90 days for the purchase of cars in all yards located within a reasonable distance of scrap consumers. Owners of such graveyards will be allowed to keep an inventory of parts.

### Labor Situation Rises Again

With appeals being made for industrial management and all other classes of the population to sacrifice more and work harder for greater output of war goods, industry this week noted with misgivings that the steel labor situation was working up to another critical point. Increasing its pressure to win a \$1 a day wage increase, as well as the checkoff of union dues and the closed shop, the Steel Workers Organizing Committee is preparing to seek elections at all plants of U. S. Steel Corp. in an attempt to establish the union, now solely representing its members as exclusive bargaining agent. The SWOC is expected soon to invoke the 20-day clause in its contract with U. S. Steel subsidiaries in order to place before the corporation wage demands already made on Bethlehem Steel Co., Youngstown Sheet & Tube Co., Inland Steel Co. and Republic Steel Corp. Since negotiations between the SWOC and the "Little Steel" companies deadlocked, a hearing has been called for Feb. 24 before a fact finding committee of the National War Labor Board. Price Administrator Henderson has opposed the steel wage rise as inflationary.

### Steel Orders Show Gains

Steel orders during the last ten days have run ahead of the corresponding period of January. Although necessary civilian requirements such as repair and maintenance are likely to be met, heavy war needs will blot out all other requirements for some months to come. More plates will be needed than generally supposed and muni-

cation requirements may expand sharply before the end of the year. The need for ships overshadows all other demands and is diverting a very large tonnage of steel from other uses.

Demand for structural shapes for freight cars and rehabilitation of new factory buildings, including such items as a new \$13,000,000 ordnance plant to be built in Ohio for the War Department, is so heavy that complete allocation for this product is not unlikely. The already rigid controls over production, consumption and allocation of steel plates were reinforced this week by a WPB request for detailed information from plate makers and consumers.

The steel bar situation has become particularly serious within the last few weeks, especially in the larger size, high carbon rounds. One company has a 4-to-5 month backlog of A-1-a orders and another mill has an 11-month backlog of such high rated orders due to the large demand for bars to go into shells and other war uses. Cold rolled high carbon strip is another product on which the imposition of allocation is a possibility. Structural steel awards for the week are estimated at 22,900 tons against 25,000 tons last week, with new projects at 18,100 tons against 25,500 tons. Reinforcing steel awards are at 36,000 tons, compared with 9450 tons, while new jobs total 10,000 tons against 19,410 tons last week.

### Site Selected for Proposed Kaiser Stock

San Francisco

• • • A site has been selected and negotiations for raw materials are underway for a blast furnace proposed to be erected by the Henry J. Kaiser interests in the Los Angeles district. It is likely government financing is contemplated for a major portion of the required capital. Several ore bodies are available in Southern California, any one of which might support a small operation or taken together a large furnace. The largest deposit which is located in the Eagle Mountains of Riverside County has been extensively drilled during the past six months by the Bureau of Mines.



HARDINGE  
HIGH SPEED  
PRECISION LATHE

TIME is a factor . . .

HARDINGE  
HIGH SPEED PRECISION  
SECOND OPERATION MACHINE

HARDINGE machines

HARDINGE  
HIGH SPEED PRECISION  
TOOL-ROOM LATHE

Produce PRECISION work

HARDINGE  
HIGH SPEED PRECISION  
MILLING MACHINE

RAPIDLY!

HARDINGE Precision Machine Tools with preloaded ball bearing spindle construction combine high speed and extreme accuracy. This and the simplicity of operation, enables relatively unskilled operators to rapidly produce parts to the necessary close limits without expensive tooling.

HARDINGE BROTHERS, Inc., ELMIRA, N. Y.

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

Wo

the  
only  
pano  
duri  
Nels  
duct  
busi  
lish  
"I

wor  
next  
year  
the  
I'm  
but  
wha  
mus  
and  
for

ind  
hap  
duc  
pan  
wha  
star  
goi  
bei

in  
rea  
cou  
dus  
cop  
so  
eve  
silv  
ren  
can  
tho  
erg  
we  
ter  
tho



# News of Industry

• • •

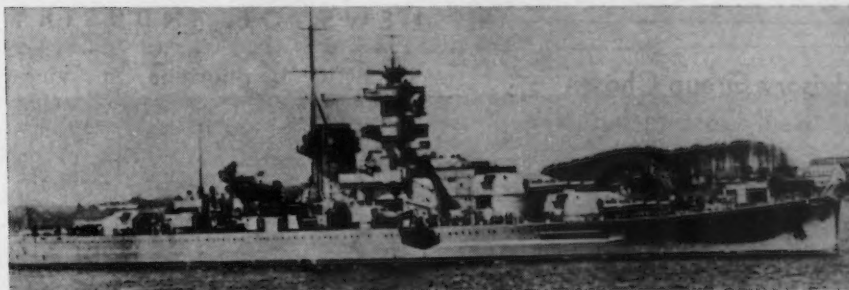
## War Lost Unless U. S. Output Soars, Nelson Declares

• • • The United States must face the fact that it can win the war only if it provides a greatly expanded production of military goods during the rest of 1942, Donald M. Nelson, chairman of the War Production Board, told a conference of business paper editors and publishers.

"Every weapon we make today is worth ten that we might produce next year," Mr. Nelson said. "This year—1942—is the critical year in the existence of the United States. I'm not painting the picture darkly, but I do believe that we who know what American industry can do must look at the situation squarely and see what we can do to make up for lost time.

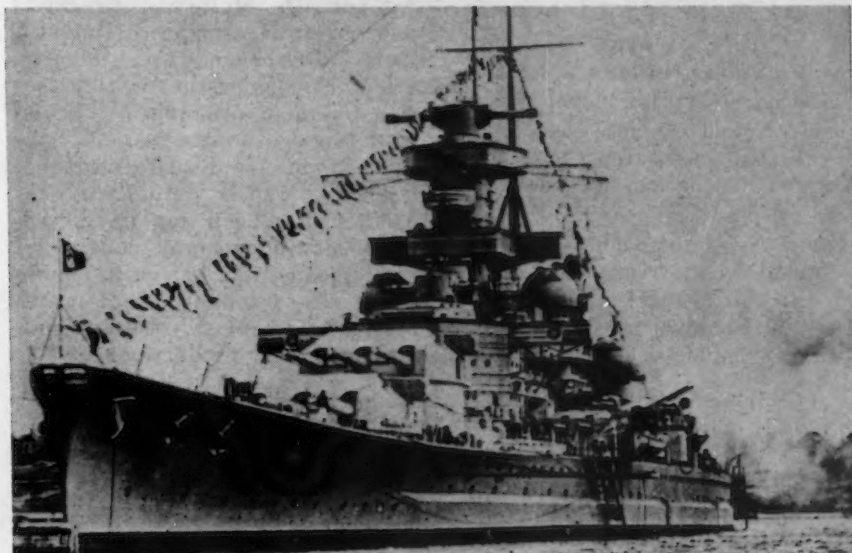
"We've lost a lot of time because industry was fearful of what might happen after the war if all our productive facilities were over-expanded. Let's stop thinking about what we'll do when it's all over and start thinking about what we're going to do now to prevent it from being all over for us.

"We've wasted the golden months in which we could have got fully ready—the months in which we could have expanded our steel industry, our chemical industry, our copper industry, and all the others, so that we would have plenty of everything. But we still have ten silver months—the months which remain in 1942—and in them we can still do things that we never thought possible. The speed, energy, will and determination which we put into those months will determine what we'll think when those months are gone."



International News Photo

**NAZI BATTLESHIPS ESCAPE:** The Nazi battleships Gneisenau (above) and Scharnhorst (below), with the cruiser Prinz Eugen, ran the gauntlet of British bombs and torpedoes as they left the Nazi-held French port of Brest and steamed through the Dover straits to havens in Helgoland Bight. The British claim that all three ships were hit by bombs, and one or more received serious damages from torpedoes.



Getting maximum production at once, Mr. Nelson said, depends on:

1. Getting greater production out of the plants and machines which are now producing war goods. Even though the country today is producing a much greater volume of armaments than in 1918, he said, the present volume is not nearly so great as it must become.
2. Getting military production out of factories and machines which are now producing civilian goods—in other words, by conversion of industry to full war production.
3. Enlisting the services of small producers, through sub-contracting and through the letting of prime contracts to groups of small manufacturers who have pooled their facilities.

"There isn't a single big producer who can't do more than he is doing now if he subcontracts part of the job," said Mr. Nelson. "Industry itself must find the way to do that job. It must not make the mistake of relying on government to do it, because we in Washington

can't possibly do more than part of it. Industry has been lazy on this whole subject, because the job has looked pretty difficult. The day for that sort of laziness has passed.

"Industry's responsibility is great, in all of this. The job will take brains and initiative; but we can do it if we go out with a will, if we stop thinking about what we're going to do to the enemy in 1943 and start thinking about what we're going to do to him in February and March of 1942.

"This country today faces the most gigantic job any country has faced in all history. We must build a great armament program; we must make up, in less than two years, what the aggressor nations have done in ten years; we must make today the things we would be making next year if we had the time to spare.

"Of course we face many problems, obstacles and difficulties. We can and will solve them, if we face the job coolly and deliberately and with determination," he said.

## Advisory Group Chosen For Steel Casting Industry

Washington

••• The formation of a Steel Casting Industry Advisory Committee has been announced by the Bureau of Industry Advisory Committees of the WPB. C. E. Adams, chief of the Iron and Steel Branch, is government presiding officer.

Committee members are: D. C. Bakewell, vice president, Union Steel Castings Co., Pittsburgh; William E. Butts, vice president, General Metals Corp., Oakland, Cal.; Herbert Farrell, Jr., vice president, Farrell-Check Steel Co., Sandusky, Ohio; Burtner Fleeger, president and general manager, Oklahoma Steel Casting Co., Tulsa, Okla.; T. H. Harvey, vice president and secretary, The Ohio Steel Foundry Co., Lima, Ohio; Oliver E. Mount, secretary-treasurer, American Steel Foundries, Chicago; Frank M. Robbins, president, Ross Meeham Foundries, Chattanooga,

Tenn.; C. L. Snowdon, Jr., vice-president, Reliance Steel Casting Co., Pittsburgh; Charles J. Symington, president, The Symington Gould Corp., New York; Charles P. Whitehead, vice president, General Steel Casting Corp., Eddystone, Pa., and William H. Worrirow, president, Lebanon Steel Foundry, Lebanon, Pa.

## McIntyre Joins WPB Ordnance Section at Washington

••• B. D. McIntyre, president and general manager of Monroe Auto Equipment Co., Monroe, Mich., has joined the War Production Board in Washington as chief of the light ordnance section of the War Production Board's Ordnance Branch. W. D. McIntyre, his brother, has been appointed vice-president and general manager of the company, to carry on in his absence. The company is now working four six-hour shifts, seven days a week, on war production.

## Machine Tool Men Work 51-Hr. Week

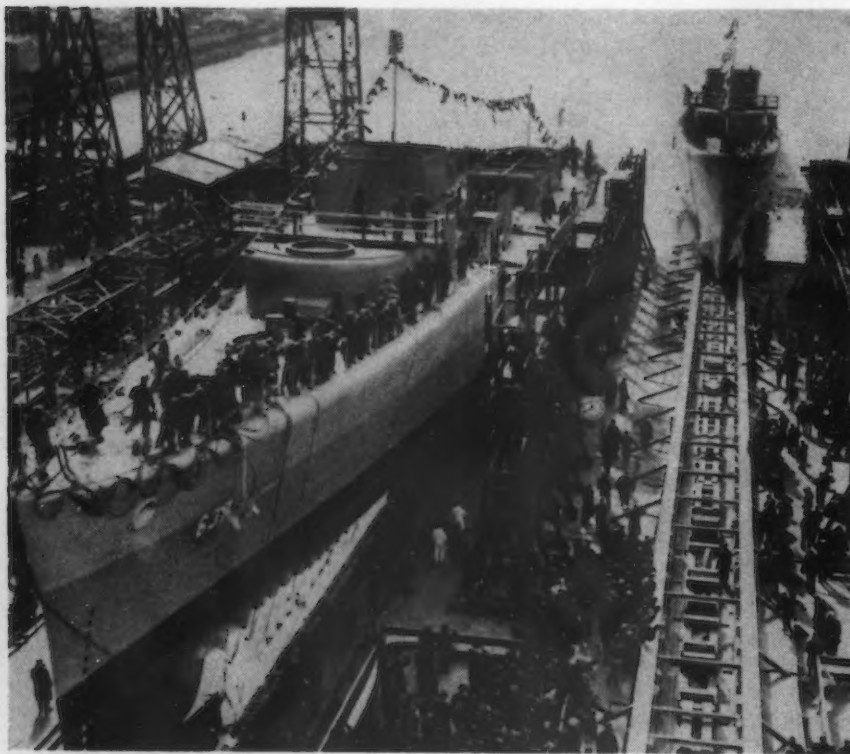
New York

••• Increased working time in important war industries after Pearl Harbor is the most striking aspect of the December wage and hour statistics compiled by the division of industrial economics of the Conference Board. In the heavy machine and foundry equipment industry, average hours per week rose from 45.9 in November to 47.7 in December. In the nation's foundries, working hours per man rose from 43.6 to 44.9.

The employees of the machine and machine tool industry took a still firmer grip on their reputation as the champion workers on defense and war work. Throughout 1941 the employees of this prime war industry averaged 49.7 hours per week, thereby beating their nearest competitors, the employees of the heavy equipment industry, by 4.1 hours. In December they averaged 51 hours per week, one hour longer than in November and by far the longest working time per man in any industry.

**THREE LAUNCHED IN TEN MINUTES:** The destroyer Butler (right) slides down the ways at the Philadelphia Navy Yard on Feb. 12, while the Gherardi (left) waits to be launched, completed months ahead of schedule. At the same time, across the Delaware River, the cruiser Montpelier was launched.

AP Photo



## Committee Formed for Steel Container Industry

••• Formation of a steel container manufacturers' industry advisory committee has been announced by the bureau of industry advisory committees. The government presiding officer of this committee is J. R. Taylor, chief of the metals and glass unit, containers branch.

Members are as follows: F. T. Barton, Jones & Laughlin Steel Barrel Co., Bayonne, N. J.; S. A. Bennett, Bennett Mfg. Co., Chicago; R. L. Brammer, Wheeling Corrugating Co., Wheeling, W. Va.; C. W. Casey, Stainless & Steel Products Co., St. Paul; J. A. Connelly, Petroleum Iron Works, Sharon, Pa.; T. W. Floyd, Wilson & Bennett Mfg. Co., Chicago; H. W. Lees, Draper Mfg. Co., Cleveland; D. F. Manion, Jr., Manion Steel Barrel Co., Rouseville, Pa.; Fred Richman, Florida Drum Co., Pensacola, Fla.; H. P. Thelan, Owens-Illinois Can Co., Toledo, O.; F. O. Wahlstrom, Southern States Iron Roofing Co., Savannah, Ga.; L. B. Keplinger, Rheem Mfg. Co., New York.



## Requests for Pig Iron Rise to New Tonnage Total

Cleveland

• • • Requests received by merchant pig iron producers for March allocations were above the total tonnage asked for in recent months. Because of this, it is doubtful that many customers with B ratings will be able to get any iron at all in March, while quite a number of the A-10 orders will have to be curtailed. This development is largely due to foundries taking a greater part in the war effort and therefore being in position to justifiably request more merchant iron to permit operations at higher capacity. In addition to this, it is apparent that those foundries which last fall had stocked up heavily on iron and scrap have now fairly well depleted their inventories.

Just how the pig iron allocation committee will handle the March distribution is doubtful, since it will face the additional problem of having to take care of those consumers whose orders will probably not be filled in February. In any event, this combination of factors apparently bunched up at this time is expected to make March a climactic month in the allocation of merchant pig iron.

## Canadian Industry Rate Of Expansion Tapers

Ottawa, Canada

• • • Analysis of Canadian business conditions in 1941 shows industry continued to expand steadily, but "no longer at the feverish rate of the first war months," says the Dominion Bureau of Statistics. The bureau's index shows the physical volume of business averaged 134.6 in 1941, an increase of 11.1 per cent over 1940, and compares with 18.8 per cent advance in 1940 over 1939. The report by the Department of Statistics states:

"Despite the completion of many military projects the value of construction contracts awarded showed a considerable increase during the year under review at \$393,991,300 representing a gain of 13.9 per cent over 1940. Output in the crucial iron and steel industry continued to advance rapidly, production of steel ingots standing at 2,412,000 gross tons in 1941.



International News Photo

**THE DEATH OF A THOROUGHbred:** The ill-fated, \$60,000,000 Normandie, recently taken over by the Navy as an auxiliary ship and renamed the Lafayette, burned at her Hudson River pier on Feb. 9. Touched off by sparks from a welder's torch, the 80,000-ton luxury liner burned for five hours, and early Tuesday morning capsized because of the weight of the water poured into her holds during the fire.

## General Steel Castings Grants Wage Increases

St. Louis

• • • General Steel Castings Corp., Granite City, Ill., has granted 300 members of the AFL Welders' and Burners' Local 530 a wage increase of 13c. an hour, with an additional increase to be granted in July. The amount of the July increase is to be determined by conditions then. A union proposal for a closed shop was waived for the duration of the war.

## DeMooy, President of Cleveland Pneumatic Tool

Cleveland

• • • John DeMooy, treasurer since 1922, has been named president of the Cleveland Pneumatic Tool Co., large manufacturer of aircraft landing gear assemblies. He succeeds Louis W. Greve, who died Feb. 2. Mr. DeMooy has been with the company for 40 years and becomes president of the concern at a time when it is completing an \$8,000,000 expansion program.

## Steel Capacity Up 4.4 Million Tons In '41

• • • Annual steel producing capacity of the United States was increased by 4,418,000 net tons last year to a new record total of 88,570,000 tons, according to the American Iron and Steel Institute. At the beginning of 1941 the nation's steel capacity was rated at 84,152,000 tons.

Since the beginning of 1940, installations of new equipment have raised steel capacity by 6,950,000 tons. The increase in the last six months of 1941 was 2,421,000 tons. Further expansion in capacity is under way.

Pig iron and coke capacity of the steel industry was also enlarged to new record totals last year. Blast furnaces producing pig iron had a total capacity of 60,394,000 net tons at the beginning of this year. This represented a gain of 2,784,000 tons last year.

The gain in pig iron capacity last year reflected the addition of five new blast furnaces, and the return to service of five long idle

furnaces which have been rebuilt. Several million tons are being added to pig iron capacity this year.

Coke capacity was increased to 54,532,000 tons as of Jan. 1, 1942. This was a gain of 1,564,000 tons over the capacity of 52,968,000 tons on June 30, 1941, when this figure was issued for the first time.

Last year's increase in steel capacity brought the total over 21 per cent above the 1929 capacity of 72,985,000 tons. The gain for last year was accounted for by large increases in open hearth and electric furnace capacity for making steel.

Additional open hearth capacity totaled 3,542,000 tons, bringing the total of such capacity to 78,107,000 tons at the beginning of 1942.

Electric furnace capacity was increased by 1,151,000 tons last year to a new peak of 3,738,000 tons. This represented a gain of nearly 45 per cent last year in the capacity of electric furnaces, which are used chiefly in the production of high quality alloy steels. Such

capacity has been increased nearly 99 per cent from the total of 1,883,000 tons at the beginning of 1940.

Bessemer steel capacity declined slightly last year from 6,997,000 tons to 6,721,000 tons at the end of the year.

## January Steel Output At New Record for That Month

• • • Steel production during January established a new record for that month of 7,129,351 net tons of open hearth, Bessemer and electric furnace steel ingots and castings.

Last month's total was nearly 3 per cent more than the previous record for January, 6,928,085 tons, established last year, but was slightly below the December, 1941, total of 7,163,999 tons.

The January total was the fourth largest for any month in the steel industry's history. The record for a single month, 7,242,683 tons, was made last October.

The steel industry operated at an average of 94.7 per cent of capacity during January. This figure

	STEEL INGOT OUTPUT IN NET TONS					PER CENT OF CAPACITY			
	Open Hearth	Bessemer	Electric	Total	Weekly Output	Open Hearth	Bessemer	Electric	Total
<b>1941</b>									
January	6,276,429	451,637	200,019	6,928,085	1,563,902	99.1	76.0	91.0	96.9
February	5,673,289	378,330	186,281	6,237,900	1,559,475	99.2	70.5	93.9	96.6
March	6,461,936	460,169	209,536	7,131,641	1,609,851	102.0	77.4	95.4	99.7
1st Quarter	18,411,654	1,290,136	595,836	20,297,626	1,578,353	100.1	74.8	93.4	97.8
April	6,135,941	395,009	225,999	6,756,949	1,575,046	100.0	68.6	106.2	97.6
May	6,365,172	444,361	243,705	7,053,238	1,592,153	100.5	74.8	110.9	98.7
June	6,103,767	458,242	238,721	6,800,730	1,585,252	99.5	79.6	112.2	98.2
2nd Quarter	18,604,880	1,297,612	708,425	20,610,917	1,584,237	100.0	74.3	109.8	98.2
1st 6 months	37,016,534	2,587,748	1,304,261	40,908,543	1,581,312	100.1	74.5	101.6	98.0
July	6,089,859	489,239	242,584	6,821,682	1,543,367	94.4	85.0	87.4	93.4
August	6,243,100	495,523	262,334	7,000,957	1,580,351	96.6	85.9	94.4	95.7
September	6,058,731	500,687	260,288	6,819,706	1,593,389	97.0	89.8	96.9	96.4
3rd Quarter	18,391,690	1,485,449	765,206	20,642,345	1,572,151	96.0	86.8	92.9	95.2
9 months	55,408,224	4,073,197	2,069,467	61,550,888	1,578,228	98.7	78.6	98.2	97.0
October	6,427,977	532,863	281,843	7,242,683	1,634,917	99.4	92.3	101.4	99.0
November	6,198,368	488,986	282,633	6,969,987	1,624,706	99.0	87.5	105.0	98.3
December	6,395,387	481,706	286,906	7,163,999	1,620,814	99.2	83.6	103.4	98.1
4th Quarter	19,021,732	1,503,555	851,382	21,376,669	1,626,839	99.2	87.8	103.2	98.5
Total 1941	74,429,956	5,576,752	2,920,849	82,927,557	1,590,479	98.8	80.9	99.6	97.4
<b>1942</b>									
January	6,332,628	490,864	305,859	7,129,351	1,609,334	95.4	86.0	96.3	94.7

Source: American Iron and Steel Institute. The percentages of capacity operated in the first 6 months of 1941 are calculated on annual capacities as of Jan. 1, 1941, as follows: Open hearth 74,565,510 net tons, bessemer 6,996,520 net tons, electric 2,586,320 net tons. Beginning July 1, 1941, the percentages of capacity operated are calculated on annual capacities as follows: Open hearth 76,079,130 net tons, bessemer 6,793,400 net tons, electric 3,272,370 net tons. The percentages of capacity operated in 1942 are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942, as follows: Open hearth 78,107,260 net tons, bessemer 6,721,400 net tons, electric 3,737,510 net tons.



is based on the revised annual producing capacity of 88,570,000 tons, as of Jan. 1, 1942, which represented an increase of 4,418,000 net tons over annual capacity of 84,152,000 tons as of Jan. 1, 1941, and an increase of 2,421,000 tons over the figure for July 1, 1941.

Last month's operating rate compares with a rate of 96.9 per cent for January, 1941, computed on the smaller capacity at the beginning of that year, and with a rate of 98.1 per cent for December, 1941, computed on the capacity as of July 1, 1941.

Steel output averaged 1,609,334 tons per week in January, compared with 1,620,814 tons per week in December, and with 1,563,902 tons per week in January, 1941.

### U. S. Steel January Shipments, 1,738,893 Tons

••• Shipments of finished steel products by subsidiary companies of United States Steel Corp. for January totaled 1,738,893 net tons, compared with 1,846,036 net tons in December, a decrease of 107,143 net tons, and with 1,682,454 net tons in January, 1941, an increase of 56,439 net tons. January shipments were the highest for that month in the history of the corporation.

### Permold Co. Receives Navy "E" Award

••• The Permold Co., Medina, Ohio, manufacturer of aluminum permanent mold castings, has been awarded the Navy Ordnance flag and a Navy "E" in recognition of outstanding effort in the production of ordnance materials vital to national defense. The award was presented to E. G. Fahlman, president of the company, by Capt. E. A. Lofquist.

### LeBlond Engineering Co. Announces Expansion Cincinnati

••• Expansion of the plant of the LeBlond Engineering Co. was announced by Harold LeBlond, president, last week. This organization took over the old plant of Remington Rand, here in Cincinnati, and the present plans call for an additional 34,000 square feet of floor space, according to the announcement.



Associated Press photo

**GODOWNS:** Steel warehouses—locally called godowns—on Singapore island hold naval stores of every type and for every need. Here is one of the depots at the base.



**SPEEDING BREN GUN OUTPUT:** Production of Bren gun magazines in a Canadian munitions plant has been substantially speeded since the recent installation of two General Electric semi-automatic atomic hydrogen welding machines. In the original factory at Brno, Czechoslovakia, this welding was done by hand. British manufacturers developed an automatic method, however, by which the outside seams of five magazines were welded at one time in a fixture. Magazines were then placed in another fixture for welding of inside seams individually. The General Electric machines permit welding of both sides of the magazines in one fixture at one operation, effecting an important saving in time.



British-Combine Photo

**HOW DID GERMANY GET THIS?** This Caterpillar tractor was captured by the British on a road near Bengazi.

## New Shipbuilding Record Seen Set By Preassembly Method

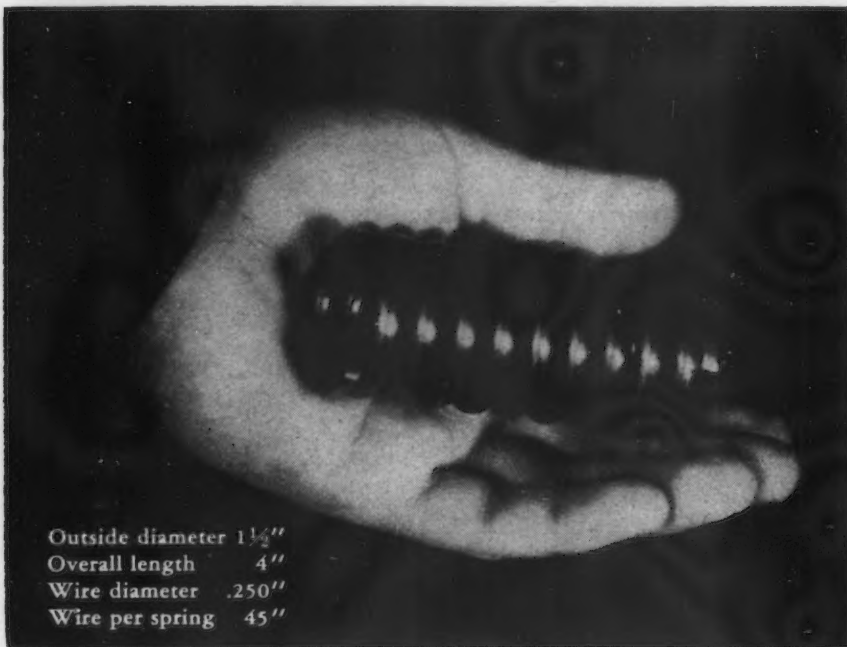
Del Monte, Cal.

• • • By adoption of the pre-assembly plan, and standardization of plate sizes, the Maritime Commission proposes to set a record in ship construction to meet the enormous government war pro-

gram of 1800 ships aggregating 18,000,000 deadweight tons in 1942 and 1943, which will require approximately 6,500,000 tons of steel.

Assuming supplies are at all times available, ships of the Liberty type vessels of the first World War days are to be completed and delivered in 105 days, as compared with the first World War record of 10 to 12 months.

In addition to these ships, the

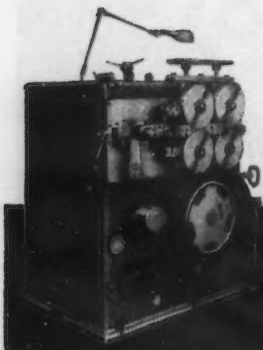


Outside diameter 1 1/4"  
Overall length 4"  
Wire diameter .250"  
Wire per spring 45"

## TORRINGTON'S W-13 SPRING COILER

*delivers 50 springs like this  
every minute!*

Hour after hour this high rate of production can be sustained, with the knowledge that every spring will be alike. Whatever the spring — extension, compression, or torsion — whatever the wire diameter (between .003" and .500") we believe one of Torrington's 13 models can make it better and faster with the product more uniformly *accurate!*



**THE TORRINGTON**  
MANUFACTURING COMPANY  
TORRINGTON, CONNECTICUT

## OPA Sees Steel Price Changes Unlikely

Washington

• • • General changes in prices of steel for second quarter are improbable the OPA has announced. Consideration of longer run policy with reference to steel prices, it stated, will be discussed fully at a meeting of industry representatives to be called soon.

OPA's statement that it does not now foresee general price changes for the second quarter was made, in response to inquiries from the Navy Department resulting from its desire to obtain firm commitments on direct purchases of steel.

Commission has an auxiliary program of 16 ore carriers, 26 harbor tugs, 25 coastal tankers and 25 large seagoing tugs. It is planned to build 8,000,000 tons in 1942 and 10,000,000 tons in 1943.

This speed-up program was explained here by Rear Admiral Howard L. Vickery, vice-president of the Maritime Commission, before the eighteenth annual Iron and Steel Conference of the California Chamber of Commerce last Friday.

In order to meet the rapidly expanding demand for ships, the Commission has increased shipbuilding facilities progressively and has arranged for Government financial assistance in the construction of 144 additional shipways. The construction of 16 more is now under consideration.

Fabricating shops have been set up in the assembly lines, Admiral Vickery said, in describing the new construction methods, which include standardization of plate sizes and changes in specifications to convert an appreciable portion of tonnage so that it will fall within strip mill limits.

This standardization and change in plate specifications is intended to serve a dual purpose; (1) relieve demands on sheared plate mills so that they can be engaged more fully on direct defense needs and (2) speed shipbuilding.

The changed specifications were published in THE IRON AGE of Feb. 5, p. 125. Gages have been reduced from '85 to 27. The number of lengths and widths also has been



reduced and provision has been made for universal and strip mill edges instead of sheared plates.

At the present time, Admiral Vickery said, the Commission is studying the effect on production of the use of plates 90-in. and less. This, he pointed out, is expected to relieve further the critical situation which resulted in the latter months of 1941 in the delivery of only approximately 50 per cent of the merchant shipbuilders' requirements.

"The commission is desirous of cooperating in every possible way to assist the steel industry in meeting this problem which has been placed upon it," said Admiral Vickery. "However, it must be borne in mind that these changes in production plans can reach a limit beyond which the changes will not permit the construction of any additional ships but merely transfer the 'bottleneck' from the steel mills to the shipyards. It appears now that we are closely approaching that limit."

The 8,000,000 deadweight tons of ships scheduled for construction in 1942, Admiral Vickery declared, will require approximately 3,200,000 net tons of steel, consisting of 2,575,000 tons of plates and 625,000 tons of shapes.

The peak load, he said, will be reached in July, when a total of 299,000 tons will be required, of which 239,283 tons will be plates and 59,821 tons will be shapes.

The importance of maintaining the proper sequence in the receipt of steel plates and shapes cannot be over-emphasized, it was pointed out, for tonnage, as such, has no significance if it is not composed of the specific items in proper sequence required by the yard's fabricating schedule. Admiral Vickery stated that there are several cases which came to his mind where the shipbuilders' production came to a standstill despite the fact that there were thousands of tons of steel in the shipyard—"thousands of tons of steel that were of no value until certain required items which were holding up construction were delivered from the mills."

The Commission, he said, has been advised by the WPB that many of the difficulties which have been experienced are attributable to the fact that the high-rated demand on the sheared mills ex-

# ROEBLING *Wires*

ROUND • FLAT • SHAPED



## SPRING STEEL

that supports  
shoe arches...

*and a maker's reputation!*



ROUND HIGH AND LOW  
CARBON COMMON  
AND SPECIALTY WIRES

Hard Drawn, Soft Annealed or Tempered,  
in all Finishes—Bright, liquor Finish, Cop-  
pered, Tinned, Galvanized.



FLAT HIGH AND LOW  
CARBON AND  
SPECIALTY WIRES

Hard Rolled, Annealed, Scaleless Tem-  
pered; Tempered and Polished, Tempered,  
Polished and Colored; Various Finishes—  
Bright, Tinned, Coppered, Hot or Electro  
Galvanized.

### SHAPED WIRES

Various High or Low Carbon Shaped Wires  
such as: Shaft Casing Wires, I Beam Sec-  
tions, Space Block Wires, Square, Key-  
stone, Oval, Half Oval, Half Round, etc.

Yes, Roebling makes cold-rolled strip that ends up in shoe shanks—seeing to it that even your oldest shoes never get fallen arches.

As you can well imagine, this steel must start out with plenty of toughness and it must be uniform in quality so that the shank after tempering will be a permanent support to the arch.

These are but a few of the tough specifications that are called for—and met at Roebling. Some customers require flawless finish. Others, flexibility. Still others, deep drawing properties.

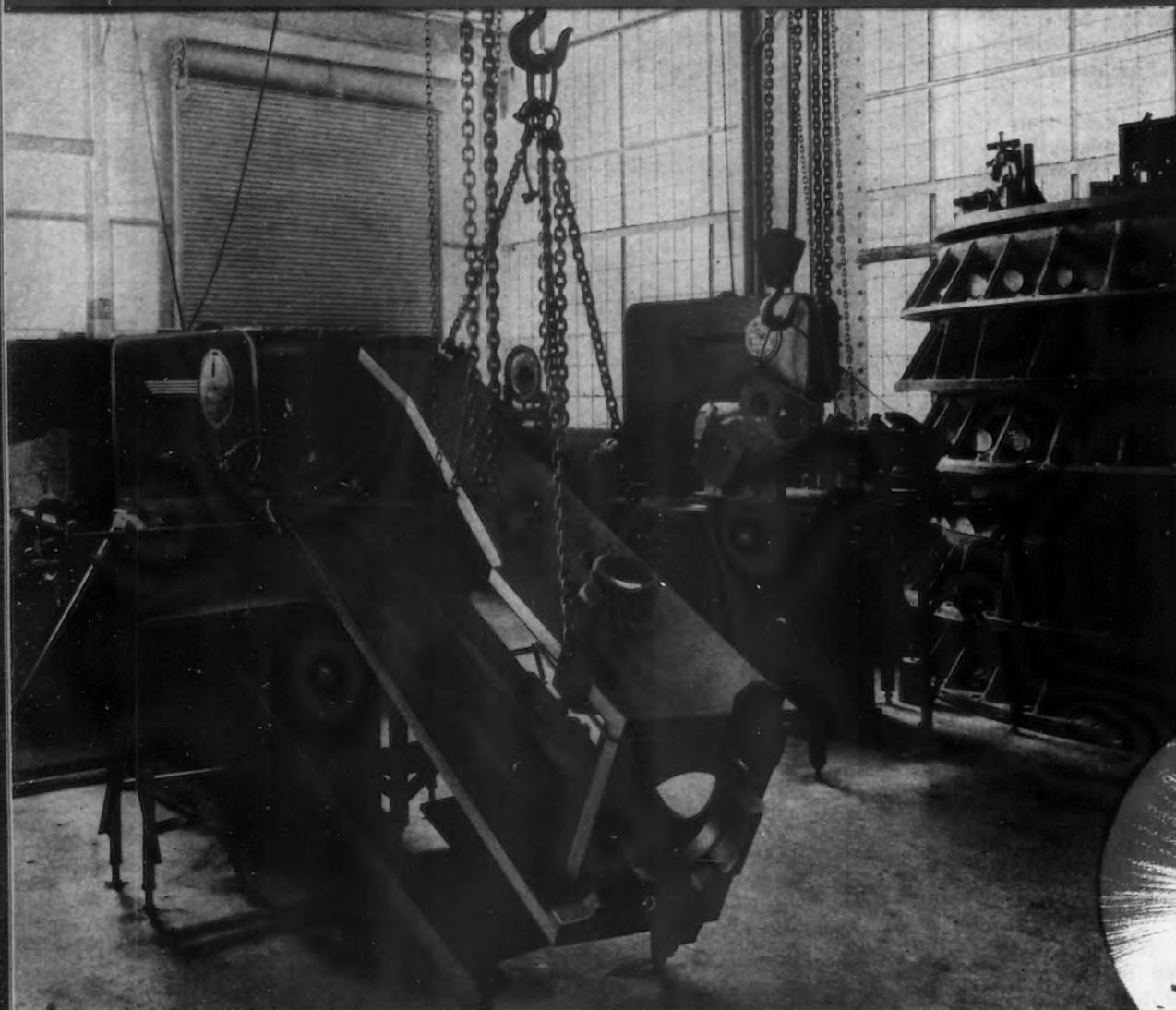
If your problem calls for exceptional steel wire making—Roebling has the specialized experience and trained organization to handle it.



## JOHN A. ROEBLING'S SONS COMPANY

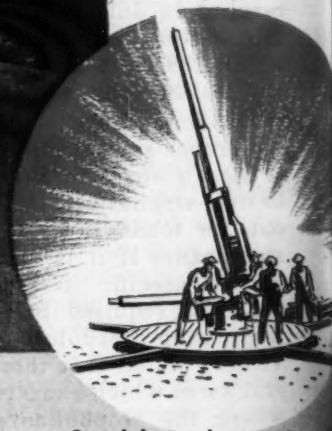
TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities

# BIG GUNS BIG PRODUCTION



## ANTI-AIRCRAFT GUN SLIDE IN 1/3 FORMER TIME

Heavy Gun Slide held in position with crane and supporting fixture to provide a 25° cut on a radius. DoAll cutting time—3 hours. DoAll investment—less than \$2,000. Former cutting time—10 hours on milling machine costing about \$45,000.



## THEN—WHEN PEACE COMES

Small and medium size plants, equipped with one or more DoAlls can accept profitable sub-contract defense orders for many parts. As soon as these orders stop, the DoAll can be immediately put to work catching up on shelved orders for civilian equipment for homes, shops and farms. The DoAll will not stand idle or have to be scrapped.

DoAll Machines with necessary equipment range in price from \$1,000 to \$5,000 complete. Prompt delivery. Don't delay another day—investigate DoAll possibilities for you. Write or wire.

★ Fastest precision method for removing metal.



Let us send a factory-trained man to your plant to show you how DoAll can save and make money for you, now and later

NEW—Interesting and valuable book "DoAll on Production", free on request.

## CONTINENTAL MACHINES, INC.

1311 S. Washington Ave.

Minneapolis, Minn.

Associated with the DoAll Company, DesPlaines, Illinois, Manufacturers of Band Saws and Band Files for DoAll Contour Machines



# DoAll<sup>★</sup> IS THE ANSWER

DoAll plays a leading part in production at the Northern Pump Company, Fridley, Minn., to speed up the delivery of \$200,000.00 worth of 5-inch Anti-Aircraft Guns for Battleships and Heavy Cruisers.

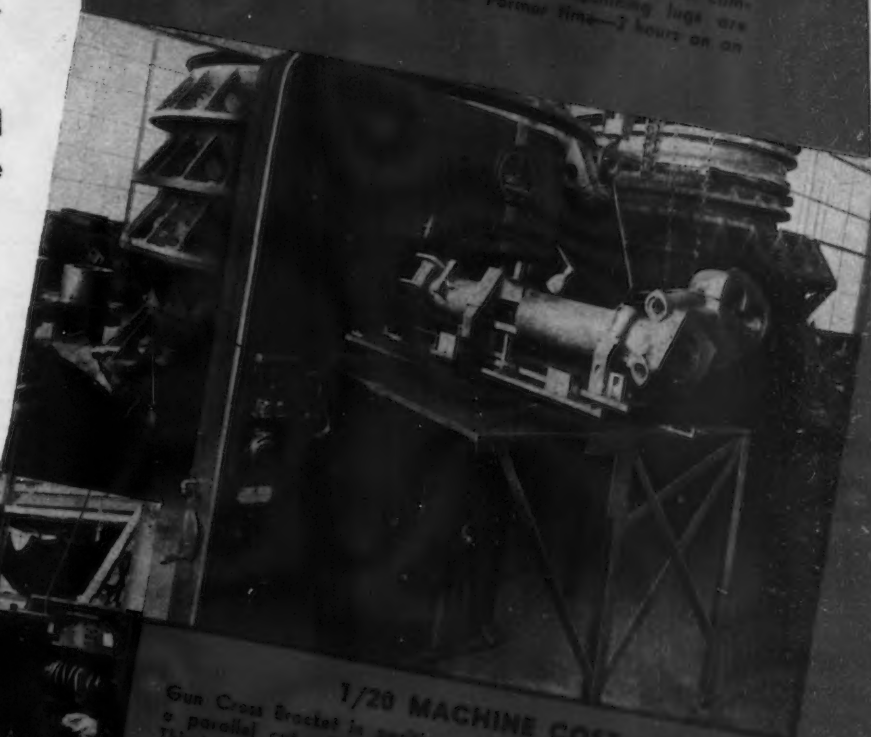
Batteries of DoAlls are used throughout the plant to do a lot of difficult operations on various parts for these guns. With the aid of special jigs, stands or hoists, the DoAll takes care of extra-heavy work formerly done on lathe, borer, broaching machine, drill, torch, cutter, shaper, nibbler and milling machines.

Savings of time are sensational and \$45,000 and \$50,000 milling machines are left free for other work.



**2 HOUR JOB IN 1/2 HOUR**

After the Bronze Gun Sight Covers for gun mounts have been completely machined to required dimensions, the machining lugs are trimmed off on the DoAll in 30 minutes. Former time—3 hours on an \$18,000 vertical miller.



**1/20 MACHINE COST**

Gun Cross Bracket in position on 40"-throat DoAll, all ready for a parallel cut. Reinforced table and crane supports the work. This job was formerly done on a \$60,000 milling machine.

**DoAlls DOUBLE OUTPUT**

At the first machine, four Transman Bearing Races are cut daily from a 4" thick drop forging. Outside contour shapes are turned and filed, and no further finish is required. Formerly, only two of these were done each day on a milling machine. At second machine, Foot Firing Pedals for gun mounts are filed. At third and fourth machines, Control Valves for foot firing mechanisms are turned and filed.



ceeded capacity. It is because of this situation that conversion to the strip mill was decided upon.

In describing new construction methods, Admiral Vickery said that fabricating shops have been set up in the assembly lines so that raw materials enter one end and are delivered from the other completely fabricated and preassembled.

Operations of shipbuilding shops, it was stated, have been so sequenced that untrained workers, who were in many cases farmhands with little or no mechanical experience, can be trained in a matter of weeks to perform the

task requiring skill to which they are assigned.

"But an adaptation of the preassembly plan, where sections of ships are assembled in the shops, necessitating merely the joining of the sections when they are taken onto the shipways, in most cases has facilitated the building to a point beyond the fondest dreams of shipbuilders of 20 years ago," said Admiral Vickery.

"In one of the shipyards a special fabricating shop is under construction which will prefabricate all of the superstructure. Vessels for this yard are conveniently handled in sections which may be

picked up by cranes and placed on the ways.

"Another yard specializing principally in tanker construction has carried the preassembly idea to the point where all of the primary portions of the vessel are preassembled. This yard has, through the use of automatic welding machines, substantially reduced further the time required for construction of the sub-assembly.

A degree of proficiency has been reached which permits the building of a tanker from keel laying to delivery in seven months and may, as their familiarity with the new facilities increases, be reduced to six and possibly five months."



Globe Photos

**RUBBER DEVELOPMENTS:** Guayule rubber plantations, being domestically developed, yield a product that after pressing into 100 lb. slabs (above) looks much like the softer grades of Hevea rubber. Such rubber can be handled in existing rubber-working equipment. Synthetic rubber (below) is also being rapidly developed. Here, Chemigum, the best synthetic rubber yet developed, is being collected after a dehydrating process. After drying, it will be formed into thin sheets, and then formed into rubber products.



### Pool Forming Activities By Subcontractors Stopped

Philadelphia

• • • Because of the combination of the Division of Contract Distribution with other government agencies, orders have been forwarded from the War Production Board, in Washington, to cease their manufacturers' pool forming activities until further notice. Four such pools have been formed in the Eastern Pennsylvania area by the DCD regional office in Philadelphia, and several others were contemplated at the time the order was issued.

It is believed the pool formation has been suspended until such time as those pools now operating have had a chance to prove their worth. So far, the pools now in operation in this area have approximately a quarter of a million dollars' worth of sub-contracts on which they are working, and from all indications are meeting deliveries on schedule.

Pools already in operation will receive no aid for the time being from DCD, but will probably continue with their work and get new contracts where possible.

### Anti-Trust Division Studies J. & L.-Otis Merger

Washington

• • • The anti-trust division, Department of Justice, on Tuesday confirmed reports that it had received an application for the merger of the Jones & Laughlin Steel Corp. and the Otis Steel Co., but did not indicate when it would take action on the proposal.



## U. S. Steel Installs 3 New Electrolytic Tin Plate Lines

••• To aid in conserving the nation's vital supply of pig tin, and to help in meeting can makers' war time demands, United States Steel Corp. subsidiaries are installing three additional electrolytic tin plating production lines and six supplemental production lines for chemically treating black plate, Benjamin F. Fairless, president of United States Steel Corporation announced. Both the electrolytic tin plate and chemically treated black plate will, in certain applications, be used as a substitute for hot dip tin plate.

These new facilities which will cost about five and one-half million dollars are to be located in subsidiary plants in the Chicago, Pittsburgh, and Birmingham districts. One electrolytic tin plate line and two black plate treatment lines will be installed in each district.

The new lines for the production of the electrolytic tin plate will have a total annual capacity of approximately 225,000 tons which tonnage under normal conditions would require the use of 3375 tons of pig tin by the conventional hot dip method compared with 1125 tons under the new process.

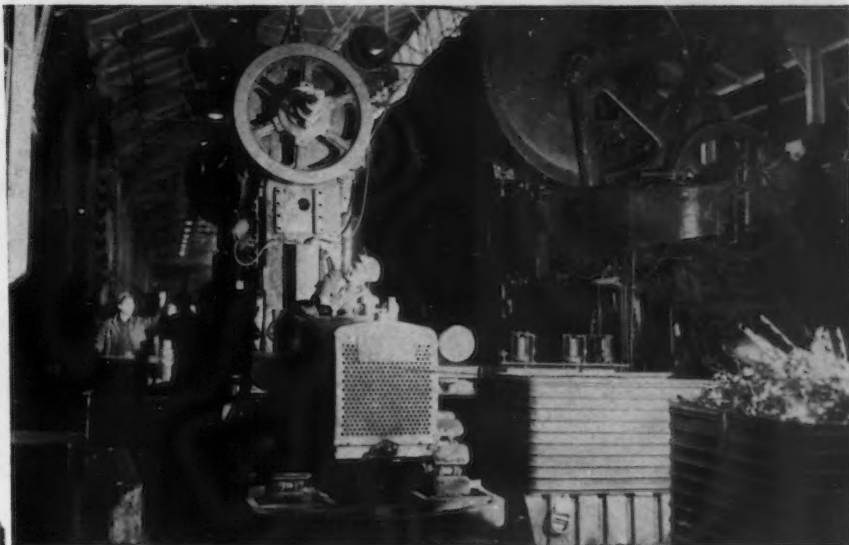
Electrolytic tin plate is produced by coating black plate with tin by means of an electric current passing through a solution, rather than the conventional dipping of black plate into molten tin.

## Cleveland Automatic Machine To Triple 1941 Production

Cleveland

••• Cleveland Automatic Machine Co., leading manufacturer of automatic lathes and screw machines and automatic spindle and chucking machines, plans to triple its 1941 output during the current year with the aid of plant expansion, the addition and training of men and greater sub-contracting.

This program was revealed to THE IRON AGE at the same time that company officers disclosed that the value of the 1941 output was double that of 1940 and five times that of 1939. Since the beginning of 1941 the company has been undergoing steady plant expansion which, when completed, will result in an addition to plant



AP Photos

**GONE BUT NOT FORGOTTEN:** An overhead crane is hooked on to help a tractor pull this large stamping mill out of the Flint Chevrolet plant, in the huge job of getting into armament production. This machinery will go into storage for the duration. The photo below shows what was once the final assembly line being changed to shape it up as a final assembly line for tanks.



space of about 80,000 sq. ft. At present the company is completing a \$340,000 expansion financed by the Defense Plant Corp. Of these funds, \$128,000 will go into new buildings to be used for assembly purposes, \$105,000 will go for installation of the necessary equipment for these buildings as well as for a recently purchased building acquired from the Cleveland Railway Co. at a cost of \$107,000.

The company's present force of 900 employees has been doubled

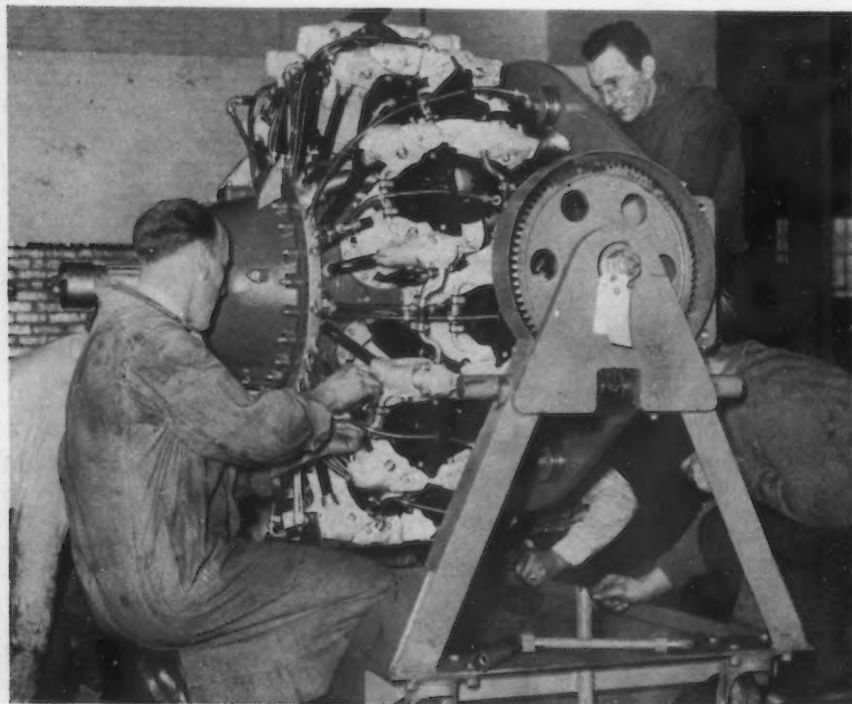
since the outbreak of the war and all of the new men have been trained by the company, which reports a very insignificant percentage of trainees failed to successfully come through the training period. At present operations are on the basis of three shifts of 48 hr. each, in addition to which some Sunday work is done.

The company reports that on an average, its subcontracting costs are twice those of its own operating costs.



Wide World photo

**RACKING BOMBS:** How bombs are carried by a B-18 training plane is explained to an aviation cadet at the Bombardier training corps advanced flying school at Albuquerque, N. M.



British-Combine Photo

**BUICK WILL BUILD THEM:** Brand new from the assembly line is this powerful Buick built bomber engine. Here it is being prepared for its initial run in the test stands.

## Hearing Date Is Feb. 24 in SWOC- Little Steel Case

Washington

• • • The SWOC-Little Steel case has been set for hearing before a special fact finding panel composed of Richard T. Frankenstein, UAW-CIO aircraft industry chieftain, and Cyrus Ching, vice-president of the United States Rubber Co., on Feb. 24, it was announced last Thursday by the National War Labor Board. The selection of Frankenstein has been the source of caustic comment. Actually he is passing upon a case in which he has predetermined views since his own organization is making the same demands upon General Motors—and ultimately the entire automotive industry—that SWOC is making on steel. At issue directly is a \$1 a day increase and the closed shop euphemistically termed "union security" by labor.

The SWOC effort obviously is to extend its demands to the entire industry whose employment aggregates about 700,000 workers, and a \$1 a day increase therefore would mean an additional annual cost of over \$200,000,000. The case immediately before the board involves the Bethlehem Steel Co., the Republic Steel Corp., the Inland Steel Co. and the Youngstown Sheet & Tube Co.

Commenting on the inflationary effect of a \$1,000,000,000 wage increase, OPA Administrator Leon Henderson said on Feb. 13 that wage increases at this time would only add to the danger of inflation and permit groups with larger purchasing power to secure a disproportionate share of available consumer goods. Increase in wages of only \$1,000,000,000 would result in an inflation threat of \$4,000,000,000 or \$5,000,000,000 and compel more extensive rationing to make sure that available goods are properly distributed, Mr. Henderson continued.

"Labor groups would do well to try to force us to hold down the cost of living and increase taxes," he warned and added, "If anything is done to prevent even a 2 per cent rise in the cost of living, it would be better than increased wages as far as wages are concerned."

A \$95,000,000,000 American income for 1942 with only \$60,000,000,000 to \$65,000,000,000 worth of



consumer goods and services to be available was pointed out as the root of inflation danger by Mr. Henderson.

Leon Henderson's now famous two-hour conference of two weeks ago with the members of NWLB was termed by him Friday as "valuable." Labor members of the Board suppressed the release of any information regarding this at the time, apparently fearing adverse organized labor reaction.

One member in denying that OPA's Chief had made any specific recommendation in reference to the \$1 increase hedged by saying that Henderson merely said general increases at the present would be an inflationary factor.

On Thursday, Wayne Morse, the member of NWLB who wrote the majority opinion in the Aluminum Co. north-south differential case, denied that wage increases would necessarily result in inflation as "some economists" insist. In saying that Henderson had not made any specific recommendations, he significantly remarked that there were 12 members on NWLB. On Friday, Mr. Henderson agreed that no particular case had been discussed at the conference, but that Board members had questioned him with specific cases in mind.

Straws indicating what industry may face if it bucks an NWLB decision were the hypothetical penalties suggested by Morse last Thursday.

All cases which NWLB cannot settle for lack of legal sanctions to compel obedience to its orders will be referred to the President who will, Morse said, request compliance with the Board's ruling. If this expediency fails, the President, in case it is industry at fault, will seize and operate the plants. For workers, as a last and doubtful measure, a "work or fight" order may possibly be issued.

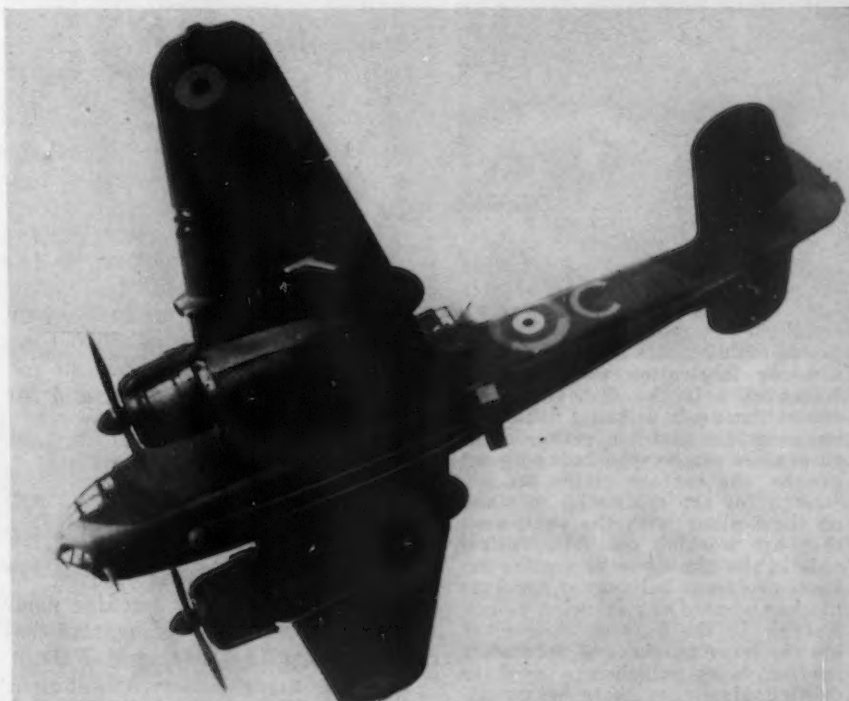
Fundamental implications were seen in the precedent set by NWLB in the CIO-Aluminum Co. case. CIO was granted a 7c. an hour increase on "hiring in" pay for beginners and for the night shift at the Alcoa, Tenn., and Badin, N. C., plants, and 5c. per hour for another, were considered.

"Facts" found by Prof. Paul R. Hays of the New York State Board of Mediation upon which the decision was based included one which dealt with the ability of the company to pay.



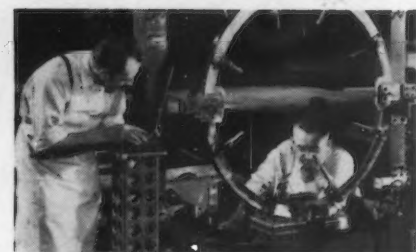
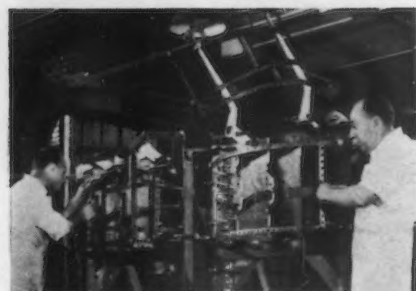
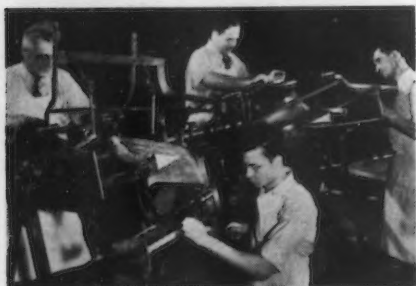
Wide World Photo

**TESTING A DIVE-BOMBER:** The SBD-3, a Douglas Navy dive-bomber, is shown here during diving tests with its perforated air brakes in use. The air brakes are used because too fast a dive impairs aim and necessitates a high pull-out.



British-Combine photo

**FIRST PHOTO** (above) showing the British Coastal Command Beaufort "destroyer" plane, in flight, carrying a torpedo in a recess in the fuselage.



**FISHER JIGS:** These photographs taken in the tool and die shop of a Detroit Fisher Body plant illustrate some of the special features to the job of building jigs and fixtures for airplane fabrication and assembly. Noteworthy is the fact that each one of these jobs is being done on a huge surface plate to maintain accuracy. As can be seen in the photographs, the surface plates are big enough for the craftsmen to stand on them along with the equipment they are working on. Also noticeable in the photographs are the accurate columns built up of accurate blocks and used as measuring points. Notable in the fixtures themselves are the large numbers of accurately spotted holes which are used in drilling aluminum parts before assembly. Also the many clamping devices that are required. The toggle action clamps are built into the jig so parts can quickly be locked in place for drilling and assembly.

## Steel Price Revision Brings Study of Average Tonnages

• • • After close study of the revised Price Schedule No. 6, covering iron and steel products (THE IRON AGE, Feb. 12, page 89) authorities early this week believed that in some respects and in certain areas served by individual companies the new setup would amount to a major change in price policies, steel company earnings and war program costs.

Steel mills are now reviewing the average yearly tonnage of particular steel products shipped into their usual market areas during the two years prior to April 6, 1941, in order to determine at what time after Feb. 4, 1942, it is permissible to charge the emergency basing point (the established basing point price at or nearest the point of production or origin of a steel shipment), in accordance with the revised price schedule.

An example of this might be as follows: A steel company customarily shipping bars into the Buffalo area will find that during the two years prior to April 16, 1941, it moved 10,000 tons of this particular product into that area. It then assumes the yearly base tonnage for the purpose of determining which basing point price to use, to be 5000 tons a year. Subsequent to Feb. 4, 1942, when the daily tonnage sheet for the Buffalo district shows that 5000 tons of bars have been shipped on the governing basing point price, then the company is permitted to start charging the emergency basing point price (the established basing point price at or nearest the point of production) on all tonnage in excess of 5000 tons.

The same procedure would be followed for all market areas and for all particular steel products.

### Washer Order Amplified

• • • Provision fixing prices of washing and ironing machine models introduced on the market between Oct. 16, 1941, and Feb. 8, 1942, is made under Amendment No. 1 to Price Schedule 86. If OPA has approved a price for such models, the schedule is stipulated as the price so approved. If OPA has not

approved a price, the price schedule applying to such models is the highest net price, f.o.b., at which the manufacturer sold or contracted to sell the models prior to Feb. 9.

### Gears, Pinions, Sprockets And Speed Reducers Covered Washington

• • • Prices for gears, pinions, sprockets and speed reducers were fixed last Thursday at the levels prevailing on Oct. 15, 1941, by OPA. Price Schedule 105, effective Feb. 18, sets up three principal categories, standards, recurring specials and special items.

Standard items are defined as those in price lists in effect Oct. 15, last, and are forbidden to be sold in excess of the list price of that date, Oct. 15, less all applicable discounts.

In this way, provision is made for the price differentials based upon quantity differences which are customary. On non-standard products, manufacturers are to compute the price to be charged on the basis of labor rates and material costs as of Oct. 15, by using the estimating formula used by them as of that date.

Special items are those which have never been made before. They are to be priced on the basis of Oct. 15 labor and material costs by use of estimating methods and price setting standards then effective.

Recurring specials are termed as any items of which two orders have been or may be received subsequent to Feb. 18, 1941, and of which \$1000 worth or at least 500 items, have been sold during that period. When an item which has been sold during the year ending Feb. 18 is first sold thereafter, the price is to be set the same way as outlined for special items, except that the manufacturer is to use his experience as to machine hours and materials required to fill the order. The price charged on that sale then becomes the maximum price for all subsequent orders.

OPA said the prices of gears,



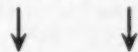
pinions, sprockets and speed reducers during 1941 increased sharply, and that even though output has been doubled, demand has exceeded it so that prices would be expected to continue upwards.

This was the last price order to be issued as a "schedule." With the price control act now in effect, all price ceilings will be issued as "regulations."



### Many Exceptions Announced

• • • Individual companies have been granted exceptions to many of the 105 price orders issued by OPA. Recently, amendments entailing such exceptions have been numerous. OPA has made the announcements in order to set its house in order for operation under the Emergency Price Act.



### Clarification on Lead

• • • Clarification of provisions establishing maximum prices for primary and secondary lead sold by plumbing supply houses is made in Amendments No. 2 both to Price Schedule No. 69 (primary lead) and Price Schedule No. 70 (secondary lead). The amendments, effective Feb. 10, re-word provisions of the schedules to make it clear that plumbing supply houses are not limited to carload lot sales of lead, but may sell less than carload lots as well. The misunderstanding arose because plumbing supply houses are required to use the carload lot prices for lead established by OPA as bases in the determination of their own ceiling prices. The new amendments also make changes in certain subdivision headings.



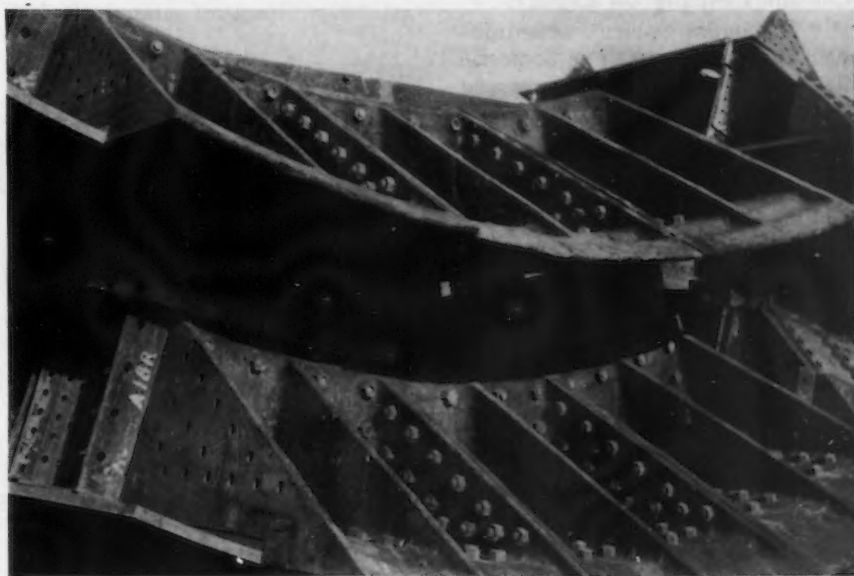
### Mercury Dealers Aided

• • • Dealers in mercury who had stocks on hand or in transit on Feb. 4, in order to meet sales contracts made prior to that date, will be permitted to deliver such stocks at contract prices until March 2. This ruling is made in amendment No. 1 to Mercury Price Schedule No. 93, announced Feb. 12. It does not apply to dealers having unsold inventories of mercury on or after Feb. 4, either in transit or in their own hands. Such mercury may not be



*Acme Newspicture*

**DOUBLE-DECK BRIDGE:** Sweeping around this approach, motorists going south on U. S. Highway 99 near Redding, Calif., will take the top deck of the Pit River Bridge to cross an arm of the great mountain lake to be created by Shasta Dam.



**TUNNEL SHIELDS** being used in the digging of the Brooklyn to Manhattan tunnel. They have just arrived from the Alco products plant at Dunkirk, N. Y., where workers specialize in constructing and welding enormous units, such as tunnel shields, heat exchangers, welded pressure vessels, etc.

sold for more than the established ceilings.



### Relaying Rail Commitments

• • • Permission is granted under amendment No. 3 to Price Schedule No. 46 (Relaying Rail) to allow relaying rail warehouses to carry out

certain commitments at a price of not more than \$1.60 per cwt. on quantities of 25 gross tons or more. This permission, however, is contingent upon the fact that the commitments were entered into prior to Feb. 7, and are completed before March 15. Under the original schedule, prior to its amendment on Feb. 7, \$1.60 per cwt. on quantities

of 25 gross tons or more was the price fixed as a maximum. On new commitments, as currently amended, the price ceiling is \$32 per gross ton on carload quantities.

### Procedure Explained

••• OPA last week issued several statements covering its new powers and establishing its procedure under the Emergency Price Control Act of 1942 which the President signed Jan. 30.

Schedules previously issued have been reviewed by Price Administrator Henderson and have been brought into conformance with the requirements of the new act. Henceforth, price control orders issued by OPA will take one of two forms: (1) Maximum price regulations, similar to the price schedules already issued; (2) temporary maximum price regulations, which will remain in effect for 60 days.

### Schedules Apply on Exports

••• Maximum price schedules covering export as well as domestic sales, apply to all deliveries on and after the date specified in the schedule whether or not a shipment has been licensed for export, it was announced jointly Feb. 13 by OPA and the Board of Economic Warfare. The new price act gives the Price Administrator the power to set maximum prices for export, as well as for domestic sales.

### Plumbing Ware Stabilization

••• Thirty-three manufacturers of vitreous china and enameled cast iron plumbing fixtures and 23 makers of cast iron boilers and radiators have been asked in telegrams sent by Price Administrator Leon Henderson to maintain present prices and to withhold threatened increases pending meetings with the industries called for Feb. 18 and Feb. 20.

### Revisions Clarified

••• Clarifying revisions to Price Schedule No. 49, resale of iron and steel products, were made by amendment No. 2 to that order adopted by OPA. One important

(CONTINUED ON PAGE 116)

## WPB Allocates Tin Plate, Issues New Steel Plate Priority Forms

Washington

••• In moves designed to provide more effective control over the distribution of important steel products, WPB has announced an allocation program for tin plate and has established new reporting requirements on steel plates affecting both consumers and producers.

C. E. Adams, chief of WPB's Iron and Steel Branch, on Feb. 16 outlined to the steel industry a comprehensive plan for rigid and detailed control over production, consumption, and allocation of steel plates. He stated that the delivery of ship plates has lagged in recent months despite an increase in overall plate production. Nevertheless an optimistic view was taken by WPB in its announcement that it is expected that plate shipments by March will be well over 800,000 tons which was said to constitute the estimated limit of actual production.

Under the new set-up two forms must be filed monthly by consumers. Form PD-298 lists in detail requirements for the following month and the uses to which plates are to be put. Two copies are to be filed with the producer, and one with WPB, at least a month in advance. Form PD-299 must be filed by the seventh of the month and lists consumption, inventories and receipts for the month and estimated requirements for the two months following.

Producers will report to WPB daily, weekly, and monthly as to the shipments of plates, and monthly on Forms PD-169 and 169-a, on schedules for the month following. Producer schedules, which call for complete and detailed information, will be analyzed by WPB and returned with whatever changes appear warranted. Only orders for plates carrying a preference rating of A-10 or higher, or those specifically allocated by the Director of Industry Operations, may be requested, scheduled, or delivered.

Objectives of the plan, as outlined by Mr. Adams, are: (1) To secure accurate information as to monthly requirements for steel plates, and to correlate this data between producers, consumers and

government agencies, (2) To obtain accurate information for government agencies as to steel plate consumption and inventories, and (3) To promote more accurate and practical control over steel plate schedules and allocations.

WPB reported that steel plate shipments in January were the highest in the nation's history, due largely to the conversion of strip and sheet mills to plate production. Shipments totaled 754,522 tons, as compared to 635,812, for December, 1941.

Mr. Adams said that consumers responded "in gratifying fashion" to the request of the branch that they redesign requirements to use as many as possible of the narrower plates produced by strip mills. Strip mills shipped 250,396 tons of plates during January. Rated plate capacity is approximately 950,000 tons monthly, of which sheared mills account for 400,000 tons; universal mills, 150,000 tons, and strip mills, 400,000.

Figured on 1.25 lb. of tin per base box, approximately 57,179,136 base boxes of tin plate will be allocated by WPB to steel mills and the canning industry for essential food packing purposes in 1942. The allocation for the first six months is 32,987,136 base boxes, and for the last half, will be 24,192,000. The order means a 19.13 per cent reduction from the tin plate consumed in 1941, which is expected to be effected by reduction in coating from 1.35 lb. to 1.25 lb. and even thinner coats, can size control, abolition of "non-essential" cans after March 1, and a limitation in the amount of tin plate which may be used for some "secondary product" cans. This action was pursuant to the Tin Conservation Order M-81 issued Feb. 12.

"Primary products" can tin plate consumption will be unlimited, and most "secondary product" cans will be permitted to use 100 per cent of the tin plate required in 1940.

Concurrently, WPB issued Preference Rating Order, P-115, granting a rating of A-1-a to canners for emergency repairs to avert spoilage or perishable pack, and an A-3 rating for maintenance, repair, and expansion. Previously canners



## This Week's Priorities and Prices

- Tin can manufacture, sale and delivery drastically curtailed in order M-81 issued Feb. 11.** At the same time preference rating order P-115 issued granting canners rating of A-1-a for emergency repairs and A-3 for other repairs, maintenance and expansion purposes. (WPB-203)
- Steel plate distribution subjected to stricter controls;** new reporting forms specified.
- Natural gas production in the Appalachian area to be spurred by relaxation of well drilling restrictions in order M-68-1.** (WPB-210)
- Coke and coal users urged to build up inventories to avoid shutdowns due to emergencies.** Inventory restrictions of Priorities Regulation No. 1. revoked for specified users in order M-97 issued Feb. 13. (WPB-217)
- Metals, burlap and rubber may not be used for highway construction or repairs if less scarce material can be substituted, according to interpretation No. 1 of order P-100 issued Feb. 13.** (WPB-216)
- Iron and steel scrap prices revised slightly in amendment No. 14 to price schedule No. 4, effective Feb. 9.** (OPA-PM2460)
- Canadian firms purchasing materials or products in U. S. granted same priority assistance as domestic plants.** (WPB-188)
- Corundum placed under full allocation in order M-89 issued Feb. 9.** (WPB-190)
- Farmers granted priority rating of A-10 for repairs to agriculture equipment in amendment to order P-100.** (WPB-191)
- Suspension orders issued against following firms for alleged violation of priority orders:** National Pressure Cooker Co.; New England Metals Co. and A.B.C. Pattern & Foundry Co. (WPB-199)
- Priorities Regulation No. 6 issued Feb. 11 removes certain limitations imposed by reference to Priorities Critical List for several "P" orders.** (WPB-195)
- Retreaded tire rationing to be supervised by OPA, according to WPB directive.** Authority also covers recaps, both wholesale and retail. (WPB-200). Specified material used by retreaders covered by order M-15-c. (OPA-PM2474)
- Rubber use further restricted in order M-15-b-1 issued Feb. 11.** (WPB-PM2543)
- Burlap price schedules No. 18 and 55 revised effective Feb. 7.** (OPA-PM2465)
- Salicylic acid prices placed under a ceiling in schedule No. 103, effective Feb. 16.** (OPA-PM2468)
- Mercury dealers permitted to make deliveries until March 2 to fill contracts made prior to Feb. 4.** (OPA-PM2475)
- Cast iron boiler, and radiator makers and plumbing fixture makers meet with OPA to discuss price stabilization.** (OPA-PM2476)
- Gears, pinions and sprocket price ceilings set in schedule No. 105.** Ceiling based on prices of Oct. 15, 1941. (OPA-PM2481)
- Copper scrap dealers instructed to send reports on PD-249 to Bureau of Mines instead of WPB's copper branch.** (WPB-206)
- Valve makers asked to simplify designs to save critical materials.** (WPB-208)
- Truck sales ban extended from Feb. 11 to 28, pending completion of rationing plans.** (WPB-211)
- Tin smelter construction in Texas to be speeded by assignment of rating of A-1-a for necessary materials.** (WPB-213)
- Steel casting industry advisory committee named.** (WPB-215)
- Old cars in graveyards to be purchased by WPB for scrapping if yards do not accept "reasonable offers."** (WPB-224)
- Refrigerator production to halt April 30. Stocks frozen; conversion of industry to war work to be speeded.** (WPB-236)
- Tungsten use in grinding wheels, gages and as coloring material prohibited after May 1 in order M-29-b issued Feb. 14.** (WPB-221)
- Tin and tin bearing materials in jewelers' hands frozen, preparatory to purchase or requisition of such supplies by WPB amendment No. 1 to order M-43-a issued Feb. 14.** (WPB-223)
- Copper mines in South America to obtain increased priority assistance in amendment to order P-58.** (WPB-227)
- Steel container industry advisory appointed.** (WPB-232)
- Relaying rail price schedule No. 46 revised in amendment No. 3, with respect to certain warehouse quotations.** (OPA-PM2486)
- Lead, primary and secondary, price schedules No. 69 and 70 revised with respect to plumbing supply houses.** (OPA-PM2487)
- Court order obtained by OPA temporarily suspending operations in cadmium and nickel by Chicago Alloy Products Co. WPB requests permission to examine company records.** (WPB-218)

## Revisions for The Iron Age Priorities Guide

• • • Following revisions are to be made to The Allocations and Priorities Guide published with the issue of Jan. 26.

Under "M Orders," page 8, add:

- M-15-b-1**—Further curtails rubber use; sets percentages of crude which may be used in making certain products. (2-11-43)
- M-15-c**—Amendment No. 6. Sets procedures for retreaders. (2-13-43)
- M-29-b**—Prohibits use of tungsten in grinding wheels, gages and as coloring material after May 1.
- M-38-e**—February lead pool set at 15 per cent. (2-10-43)
- M-43-a**—Amendment No. 1. Freezes stocks of tin and tin bearing material in jewelers' hands. (2-14-43)
- M-68-1**—Relaxes certain restrictions with respect to drilling new natural gas wells. (2-13-42)
- M-81**—Tin use curtailed by restriction in production and sale of tin cans, tin and terne plate making. (2-11-42). Related form: PD-269.
- M-89**—Establishes allocation of corundum (2-7-42). Related form: PD-293.
- M-97**—Encourages stocking of coal and coke by large industrial users. (2-13-42)

Under "P Orders," page 4, add:

- P-29**—Amendment No. 2 (2-14-42). Revises method of extending order.
- P-58**—Amendment. Increases priority aid to South American copper mines. (1-1-42)
- P-100**—Amendment. Extends priority aid to farmers for agricultural machinery repairs. (12-10-42)
- P-100**—Interpretation No. 1. Forbids use of certain critical material for highway repairs if substitutes are available. (2-13-42)
- P-106**—Assigns ratings of A-1-a to A-3 to mills which roll, draw or extrude copper and its alloys (2-7-42). Related form: PD-258.
- P-115**—Rating of A-1-a to A-3 assigned for repairs and expansion of food canning plants. (2-11-42). Related forms: PD-285, 81a.

Under "L Orders," page 7, add:

- L-42**—Orders simplification of design of iron, brass and bronze valves (2-11-42)

Under "S Orders," page 7, add:

- S-8**—Suspends certain operations at National Pressure Cooker Co. (2-10-42)

## GET IN THE SCRAP!

● With this slogan the War Production Board inaugurates its nation-wide salvage campaign.

● "Scrap is needed to win this war", says Lessing J. Rosenwald, Chief of the WPB Bureau of Industrial Conservation, which has charge of this drive.

● The bulk of the iron and steel scrap needed to win this war must continue to come from industrial plants.

● One of the greatest contributions *YOU* can make to a Speedy Victory is to assist in the maximum flow of scrap from your plant.

● Can you help to keep steel mills and foundries going at full capacity?

● If we can be of aid in the movement of your scrap to market, write or 'phone.

### The **CHARLES DREIFUS** Company

(Broker in Iron and Steel Scrap for  
40 years)

Philadelphia, Pa.	Pittsburgh, Pa.
Widener Bldg.	Oliver Bldg.
Rittenhouse 7750	Atlantic 1856

Worcester, Mass.  
Park Bldg.  
Worcester 6-2535

had operated under P-100 which only carries a rating of A-10.

While the conservation order permits black plate coating to run as high as 1.5 lb. in the case of cans to contain acid fruits, vegetables and chemicals such as sauerkraut, berries, cherries, plums, etc., and cresols, pectin, and nicotine sulphate, steel mills are generally limited to tin coating with a pot-yield thickness of not more than 1.25 lb. per base box.

Cans plated by the electrolytic method for some purposes may be reduced to 0.5 lb. of tin per base box, and though present production is limited to four companies producing about 3,000,000 base boxes of electrolytic plate per year, an additional six companies are expected to bring new lines in by 1943.

None of the restrictions apply to purchase orders bearing a higher rating than A-2. The order applies to both the canner and the can manufacturer. It prohibits any canner from buying, accepting delivery of, or using for packing cans more tin, tinplate or terneplate than is permitted under the order. If orders have been placed with steel mills exceeding such amount, such excess must be cancelled.

#### Pittsburgh

● ● ● With no limit placed upon production of primary product cans used for packing certain important fruits and vegetables, tin plate mills expect an avalanche of orders for the production of this type of cans between now and the early packing seasons.

Although there are no restrictions on the use of black plate for the manufacture of containers, current conditions in the steel industry are such that black plate will probably not be available in large quantities for such purposes unless the orders carry a priority rating. Furthermore the use of lacquered black plate for containers will also be affected by black plate requirements for tin plate production allowed under the conservation order. Consequently, consumption of black plate for uncoated containers depends entirely upon mill schedules and supply of raw steel material available after high priority rated business has been taken care of.

Although the can order adequately takes care of specific can production for primary food products, no provision has been made as yet to assign priority ratings on tin plate for specific purposes such as the production of primary product cans. The lack of priority ratings could result in there not being enough tin plate available for the production of primary product cans at a time when there was urgent demand because of canning conditions. Although mills and can companies are well aware of the importance in all-out canning of primary food products it is still a fact that in accordance with priorities and allocations set up, tin plate so far this week had no "legal" standing as far as priorities were concerned. It is also believed that some action may be taken soon to assure production of caps and closures where urgently needed, although so far no specific provision has been made. Some action in tin plate priorities may be taken soon.



#### Tungsten Use Curbed

● ● ● Further conservation of tungsten has been ordered by WPB with issuance of conservation Order M-29-b. The order prohibits use of tungsten in grinding wheels, gages, and as a coloring material for rubber, linoleum, paper or other similar materials after May 1, 1942. Until that date, use of tungsten in these items is limited to 17½ per cent of the amount used during the year ended June 30, 1941.

All other users of tungsten, except those specifically exempted, must reduce their use between February 1 and March 31 to 12 per cent of the amount used in the year ending June 30, 1941. Such users, after April 1, are limited by calendar quarters to 17½ per cent of the amount used in the base year.

Exemptions to the order include use of tungsten for Army, Navy, Lend-Lease and other Government contracts; to comply with safety regulations; orders bearing preference ratings of A-1-j or higher; corrosion-resisting material; alloy steels hard-facing materials; hard-cutting tools and tool tips; atomic hydrogen welding rods laboratory



reagents and pharmaceuticals; laboratory research equipment; electrical equipment; radio and x-ray equipment; electronic relays and electric lighting uses, both filament and fluorescent.

### Orders Valves Simplified

• • • WPB last week instructed the plumbing and heating industry to simplify the manufacture of iron, brass and bronze valves in an effort to save critical materials and dispose of slow-moving inventories in Order L-42, which will be followed by a series of amendments requiring simplification of many other items manufactured by the plumbing and heating industry. Manufacturing specifications for these products were worked out by the Plumbing and Heating Branch after long study with industry representatives and with the Bureau of Standards and other interested government agencies.

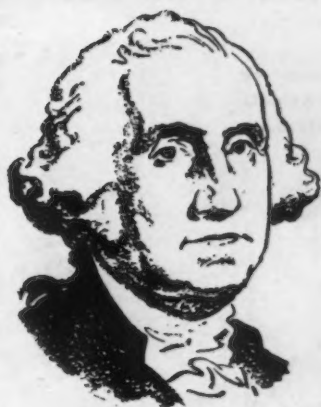
Schedule 1 to Limitation Order L-42 sets forth specifications for the manufacture of iron, brass and bronze valves, and provides that no valves which do not conform to the standards can be produced after March 1. Exceptions are granted for deliveries of valves which already were in stock or had been processed before March 1.

### Coke Stocking Urged

• • • WPB has revoked the inventory restrictions imposed by Priorities Regulation No. 1 insofar as they apply to coal and coke and told utilities and industrial users of these products to build up their inventories as much as possible. General Inventory Order M-97, WPB said, was issued to avoid the danger of having to suspend operations in case of an emergency.

### Smelter Rating Raised

• • • The tin smelter now under construction near Houston, Texas, has been given an A-1-a rating for construction materials to speed its completion, WPB has announced. The former rating was A-1-b. The plant, which was started as an 18,000-ton smelter, has been expanded to 52,000 tons, and the capacity may be further increased, it was said.



Since  
1795

## A Reliable Source of Supply

IN 1795, during Washington's second administration, there was born in Pennsylvania an enterprise predestined to exert a marked influence on American industry. This organization today bears the name of Standard Steel Works Division.

Through five wars and ten major commercial depressions this organization has produced iron and steel products, first for the infant industries of Pennsylvania and later for America's industries and railroads.

The speed and the quality with which Standard is producing for America's war needs is evidenced by its early award of the coveted Navy E.

The traditions of this 146-year-old organization give its personnel a wealth of experience and a sense of responsibility that are reflected in the quality of its products.

Standard Steel Works Division, The Baldwin Locomotive Works, Paschall P. O., Philadelphia. Works at Burnham, Mifflin Co., Pennsylvania.

**SERVING AMERICAN  
INDUSTRY WITH—**

**FORGINGS...STEEL CAST-  
INGS...STEEL WHEELS...WELDLESS RINGS**



# STANDARD STEEL WORKS

DIVISION OF  
THE BALDWIN LOCOMOTIVE WORKS  
PHILADELPHIA

These and other important ordnance buildings are roofed and sided with galvanized corrugated ARMCO Ingot Iron — for long-time weather protection.



## Weather protection on a LONG-TERM LEASE

• “Build ‘em fast” counts most these grim days, yet construction engineers are not losing sight of the post-war value of buildings erected now for army ordnance and arms production.

That’s why corrugated galvanized ARMCO Ingot Iron is being used for roofing and siding on so many new structures needed for America’s victory-drive. Engineers are sure of fast, easy erection and long, low-cost service life.

There are other important advantages too—in war or in peace. Metal buildings can be dismantled and erected again on another site. They assure protection against fire and, when grounded, from lightning.

ARMCO Ingot Iron has proved its worth in industrial service. This metal has the longest record of service of any low-cost iron or steel sheets. Installations dating back as far as 1909 are in good condition. Yet galvanized ARMCO Ingot Iron, with all its durability, costs *only about 1c a pound more than ordinary galvanized steel.*

If you are designing or constructing buildings for war production write for complete information about galvanized ARMCO Ingot Iron\*. We’ll give you proof of its long life and low maintenance cost. The American Rolling Mill Company, 811 Curtis Street, Middletown, Ohio.

\*For immediate painting and long paint life ask about galvanized ARMCO Ingot Iron PAINTGRIP.

A LABEL KNOWN TO MILLIONS.



## PD-1a Uses Simplified

• • • Following the recent abolishment of the Priorities Critical List, WPB last week announced that it had eliminated the necessity for a large number of individual applications on PD-1a forms for ratings to be used for obtaining material by industries which operate under “P” orders. This action was taken by removing the limitations previously imposed by the necessity of referring to the critical list before issuance of ratings under a number of “P” orders.

This new step was announced in the form of Priorities Regulation No. 6, issued Feb. 11 to take effect on that date.

A number of general preference orders which were written prior to August, 1941, when the Critical List was last amended, provide that the ratings assigned by such orders shall not be applied except to items which appear on the list. Regulation No. 6 removes this limitation and allows the ratings assigned by any “P” order to be used on deliveries of any material otherwise covered by the order.

It does not, however, remove any special restrictions or special materials lists which may be included in the terms of any order.

The Defense Housing Critical List, which constitutes a limitation on the use of preference ratings assigned by Defense Housing project ratings, remains in full force.



## Highway Repairs

• • • WPB has asked highway departments to stop ordering metal culverts, road signs, rope or cable, and guard rails when terra cotta, cement or wood could be used. WPB has pointed out that the use of Preference Rating Order P-100 for repair and maintenance, is subject to the general provision that scarce materials must be eliminated by change of design or substituted for wherever practicable.

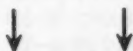


## Airline Order Clarified

• • • The Division of Industry Operations has issued an interpretation of order P-47, which makes it clear that the preference ratings



assigned under the order may be applied to deliveries of such necessary articles of airline operation as maintenance equipment, ground radios, tools and essential office machinery, as well as to material which is to be physically incorporated in a plane.



### Corundum Allocated

••• To avert a possible shortage of corundum, stocks of this abrasive material have been placed under an allocations system by WPB, with the issuance of general preference order M-89.

The order provides that corundum used in manufacturing some civilian products may be curtailed, and that suppliers of corundum will make deliveries only when specifically authorized by the Director of Industry Operations. The Director will periodically allocate corundum and specifically direct the manner and quantities in which deliveries shall be made.

Future allocations may be made without regard to any preference ratings assigned to particular contracts or purchase orders, but will be made to insure the filling of Government war orders, both direct and indirect. The order makes it mandatory for each corundum supplier to file all the information required by Form PD-293 with WPB on or before February 20, 1942, and on or before the tenth day of each calendar month thereafter.



### Plate Setup Likened To Pig Iron System

Pittsburgh

••• The new setup on the allocation of all plates by which the customer takes the responsibility for getting order and other data on his plate materials to the steel mills by the first of the month preceding the month of production, is taken in steel circles to be an adaptation of the pig iron allocation order. Furthermore, it is believed in informed circles that the success of the new plate allocation setup may be a trial balloon which might be

It's the Zip-Lift — neatest, smoothest little load-lifter in the business! This is no glorified chain block, but a true electric hoist with non-spinning wire rope and full magnetic push-button control. It's built for 3 types of interchangeable mountings — for hook, bolt, or trolley suspension. It'll cut your costs with "thru-the-air" handling wherever loads must move quickly, efficiently, and dependably.

It's surprising how far your hoist dollar goes with the long life Zip-Lift. And remember, honest delivery promises are P&H by-words. Call your nearest P&H representative or write us direct.

P&H Electric Hoists are available in all capacities up to 15 tons.



CAPACITIES: 250, 500, 1,000 lbs.

General Offices: 4401 West National Avenue, Milwaukee, Wisconsin

**HARNISCHFEGGER**  
CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS  EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

extended to all or some other steel products if the pressure for war material production becomes as great as expected within the next month or two. Although plate consumers have until March 1 to get certain material to the plate producers for April schedules, some plate makers are making Feb. 28 the deadline owing to March 1 falling on Sunday. The time element is all-important in the success of

this plan since the plate producers must send their material to WPB by March 12 and are supposed to obtain the revised forms back from WPB by March 22, which gives a very short time to schedule April production. Plate consumers who do not get their forms in on time to plate producers may find that their tonnage will be unable to get a place on April schedules.

## Allocation Control Over Aluminum Completed

Washington

••• Complete allocation control over aluminum became effective on Tuesday with the issuance by J. S. Knowlson, director of WPB's bureau of industry operations of supplementary order M-1-F, replacing orders M-1 and M-1-A. This leaves allocation control over aluminum in substantially the form in which it is being administered but is somewhat more comprehensive in its regulations.

Each producer must file on form PD-26A a shipping schedule for each month by the fifteenth of the preceding month when specific allocations will be made. The schedules must be limited to essential items, as defined in order M-1-E. Customers must file by the fifth of the preceding month a request for any item and information concerning its end use. Users, except government agencies, must file by April 20 on form PD-40A and quarterly thereafter. Stocks in excess of immediate needs must be sold promptly on certification by the buyer that he will use the material in fulfillment of rated orders for essential items or sold as scrap under the terms of order M-1-D.

## Sale of Aircraft Limited

Washington

••• In an order sent to each of the 53 manufacturers of light aircraft, WPB on Tuesday limited the sale of new planes having less than 500 hp. and restricted the amount of aluminum that may be used in the airframes of certain of them. The planes affected by the order No. L-48 were defined as all new aircraft using an engine or engines of less than 500 hp. in the aggregate, which were completed on or after Oct. 1, 1941, and which have been flown less than 100 hr. The order bars beginning of manufacture of any light aircraft containing in its airframe more than 18 per cent aluminum or any light aircraft which has ribs of any other material and which contains in its airframe more than 12 per cent aluminum. After Sept. 1 manufacture of any light aircraft can be continued if it contains more than 12 per cent aluminum in its airframe, regardless of whether it has aluminum ribs.

# DEMPSEY INDUSTRIAL FURNACES



*"Keep  
'em  
Flying"*

**Recirculating  
Type Heat Treat-  
ing Furnaces Im-  
portant Factor in  
National Defense  
in the Air ★ ★ ★**



★ Recirculating Type Heat Treating Furnaces  
in an Aluminum Fabricating Plant

NEVER in all recorded history has the demand on industry equalled that of today! This is especially true in airplane construction. Undreamed of production has been achieved and is ever increasing. Only the best is good enough to stand up under this vast program. That is why Dempsey Furnaces play such a prominent part in the melting and all heat-treating processes of aluminum and aluminum alloys in so many leading airplane factories. Engineered efficiency, proved dependability and sturdy construction make them the obvious choice for this all-important emergency service. Dempsey installations are tailored especially to meet your exact requirements, and include . . .

Recirculating  
Continuous Conveyor  
Bright Annealing

Clean Hardening  
Shell Forging and Nosing  
Cartridge Case Annealers

Billet Heaters  
Coil Annealers  
Normalizers

WRITE FOR BULLETINS AND COMPLETE INFORMATION



**DEMPSEY INDUSTRIAL FURNACE CORPORATION**

SPRINGFIELD, MASSACHUSETTS

**FURNACES—OIL & GAS BURNERS**

*Offers Combined 50 Years' Experience Building:*

DEMPSEY FURNACES since 1917 • GILBERT & BARKER since 1908



## Cold Finished Bar Makers Get WPB Instructions

Pittsburgh

••• Although cold finished bar makers have been advised by the WPB that the allocation of hot rolled material to them will not become effective until the beginning of the second quarter, they have been instructed to produce no cold finished material except on orders carrying a priority rating. They have also been advised that they must keep an accurate record of cold finished bar production, classified as to the various priority rated levels, and it is understood that such a record does not include "B" ratings.

Some producers, it is believed, have already received a copy of the form to be used in showing the production of cold finished bars at each priority level, with provisions for recapitulation, whereby, for instance, the amount of tonnage up to and including A-3 etc., is to be shown.

Based upon the known cold finished bar requirements in the higher priority brackets, there is a possibility that extreme difficulty might be encountered soon in filling some orders carrying lower ratings such as A-8, 9 and 10.

## Purchasing Policy on Chromium Changed

Washington

••• Domestic production of chromium is expected to be increased as a result of a change in the purchasing policy for chromite mined in the western states. The change was decided on at a meeting on Monday of representatives of WPB, RFC and the latter's subsidiary Metals Reserve Co., and provides that producers can now dispose of ore in small quantities. Previously sales were restricted to lots of 1000 tons or more.

## Cleveland Priorities Head Quits

••• W. T. Walker, Cleveland district manager of the WPB priorities section, has submitted his resignation from the post. Head of the Cleveland priorities office since last June, Mr. Walker stated he was resigning to return to private industry.

## International Machine Tool Reports \$916,947 Profit

Elkhart, Ind.

••• Summarizing operations of the International Machine Tool Corp., during the first 10 months of its new fiscal year that ended Oct. 31, 1941, net profits after provision for all taxes totaled \$916,947, equivalent after preferred

dividend requirements to \$2.68½ a common share.

Production, it was pointed out, was 200 per cent higher in October, 1941, than in January. Increased facilities, sub-contracting of some 2,000,000 man-hours work on machine parts, streamlining assembly lines, and adoption of supervisor training have all aided in the effort to increase production.

# ARMSTRONG



## You can "eat your cake\* and have it too" with ARMSTRONG TOOL HOLDERS (\* High Speed Steel)

Take the high speed steel needed to make a forged tool for any operation on lathes, planers and shapers—by using an ARMSTRONG TOOL HOLDER for that operation you can have the same high speed cutting point and still have 90% of your high speed steel left over for other work.

In ARMSTRONG TOOL HOLDERS each ounce of high speed steel will do the work of 10 ounces in a bar tool. And, every ARMSTRONG TOOL HOLDER is a permanent, multi-purpose tool that effectively replaces a complete set of forged tools. With each ARMSTRONG TOOL HOLDER a more efficient tool can be forged—a handier tool, with exactly correct cutting angles and approach angles, a more rigid, more accurate tool with strength to stand up to any speed or feed that the machine tool can attain. It is utter waste to forge tools for standard operations, especially today.

### ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

309 N. FRANCISCO AVE.

CHICAGO, U. S. A.

Eastern Warehouse & Sales Office:  
199 Lafayette St., New York



ARMSTRONG TOOL HOLDERS Are Used in Over 75% of the Machine Shops and Tool Rooms

## On the Assembly Line

(CONTINUED FROM PAGE 72)

backed by years of experience, seem to be an inescapable conclusion when Mr. Romney's figures, above, are considered—and for those who like to conjure with figures there is meat in a reconsideration of the industry's traditional profits on its

invested capital. It does appear now that the industry is likely to slip in the next few years and—if that happens—maybe the financial positions of weaker automobile companies will become precarious ones.

Combine this financial question with the picture of complete disorganization of auto production facilities in most of the plants, and

you have some interesting questions: "Who will be the builders of (a) automobiles, (b) airplanes and (c) refrigerators, washing machines, vacuum cleaners, and other similar goods, in the post-war period?" And: "Who will own these production facilities, or will have them as collateral?"

## Del Monte Meeting

(CONTINUED FROM PAGE 80)

tive of the priorities division as "directing the flow of materials in adequate quantities and with proper timing into the war industries and into the essential industries of this Nation, to the end that our war effort shall be successfully terminated at the earliest possible date." He declared that "it is obvious that as time goes on, the number of rationed articles must increase."

Hope that two out of every three California plants could soon be brought into war production through prime and sub-contracts was expressed by Col. Frank M. Smith, state manager of the WPB contract distribution branch.

The state's great labor reservoir has not yet been extensively tapped, he stated. With almost an equal population to Ohio, California has only one factory wage earner to every two in Ohio.

California companies have been awarded 4.6 per cent of the total contracts awarded since June 19, 1939, he said. With few specialized small and medium sized shops in the state, a "bits and pieces program" far beyond that undertaken in England will have to be developed.

Rear Admiral Howard L. Vickery, vice-chairman of the United States Maritime Commission, declared in a paper read before the conference that increased merchant ship construction goals could be met "only through a more extended use of existing facilities and by the application of new ideas and methods in the construction of ships." Although government financial assistance has been extended for the construction of 144 additional shipways, and construction of 16 more is under consideration, these new shipways alone will not make possible the necessary production tempo, he said.



The high versatility of this HydroILic Press, the DLOS2, is typical of the efficiency that ranks HydroILics as Industry's new "right hand" in production. Readily adaptable for assembling, straightening, bending or broaching, the DLOS2 handles either small-lot or production-line work with equal accuracy. It is built in capacities of from 25 to 100 tons, is supplied with either a guided platen or threaded ram, and is equipped for either manual or electric control.\* In all operations calling for *controlled power*—from a few pounds to a hundred tons, exerted in any direction—HydroILics offers the right combination of **POWER, SPEED and CONTROL**. In all industries, HydroILics is doing old and new jobs *better*, with all types of HydroILic control and power equipment, from 3/4-inch valves to hundred-ton presses!



Find out how HydroILics can help you — with **POWER, SPEED and CONTROL** — on your own production. Call your Denison representative or write directly to the factory.



\*Bulletin 108, giving complete details and specifications of the DLOS2 will be sent you promptly on request. Please tell us the tonnage you desire.

**THE DENISON ENGINEERING COMPANY**  
108 WEST CHESTNUT STREET, COLUMBUS, OHIO



Time required for construction of Liberty type ships has been cut to 60 days on the ways and 45 days on the water—or a total of 105 days from keel laying to delivery—an all time world's record for ship production, according to Admiral Vickery.

Maintenance of this scheduled pace is dependent on ability of suppliers to deliver materials in adequate quantities and in sequence. Because high rated steel plate demand exceeds sheared mill capacity nationally by 50,000 to 60,000 tons per month, the Maritime Commission has endeavored through changes in specifications to convert an appreciable portion to its tonnage so that it will fall within strip mill limitations, Admiral Vickery pointed out. Further Commission instructions to shipbuilders reduce the number of gages used from 85 to 27 and reduce the number of lengths and widths.

"At present the Commission is studying the effect of using plates 90 inches and below on our production and this is expected to relieve further the critical situation which resulted in the latter months of 1941 in the delivery of only approximately 50 per cent of the merchant shipbuilders' requirements," he said.

Urging that specifications by foundry customers leave the choice of casting method and composition to foundrymen, and that only desired properties be specified, Mr. Simpson, A.F.A. president, called attention to the wide diversity of methods and materials now available. He traced the industrial service of the foundry industry from 3000 B.C. to the present. The present trend, he stated, is toward a so-called production jobbing foundry "so laid out as to be flexible for miscellaneous production, yet equipped to afford the operating department the maximum of control of the variables in producing its castings, namely sand, molding, metal, pouring, cores, mold handling, cleaning, finishing, etc."

Col. Wayne Allen, purchasing adviser, WPB division of purchases, urged the manufacturers to "play straight and fair" in attempting to obtain materials and to conserve wherever possible.

C. B. Tibbetts, chairman of the conference, termed proposals to move industrial plants inland

"asinine." "We don't want more industries, but we must use our present facilities to full capacity to win the war; if we're bombed—we'll take care of that when the time comes."

Resolutions passed supported the Smith "anti-strike bill," urged extension of the legal basic work week from 40 to 48 hours for the duration, opposed "new and costly

social security proposals, and asked reduction of government expenditures non-essential to the war.

Officers elected were H. M. Tayler, Tayler & Spotswood Co., San Francisco, chairman; S. E. Gates, General Electric Co., Los Angeles, vice-chairman, and C. S. Knight, State Chamber of Commerce, secretary.

## Your METAL CLEANING Problems Are Solved Here

ENGINEERS who think in terms of metal cleaning... skilled chemists... production men with years of experience in building metal cleaning equipment... all comprise the Detroit Rex organization. All of them are at your service.

They have been responsible for some of the most important developments in metal cleaning processes. Today in Detrex drafting rooms, machines are being designed for even faster, more efficient production. In Detrex laboratories, constant progress is being made in developing the most effective cleaning compounds and solvents. In Detrex factories, machines are being built to give you years of trouble-free service.

- Above: One of the several Detrex drafting rooms
- Center: A view through one of the Detrex factories
- Below: Two of the modern laboratories in the main Detrex plant



**SOLENT DEGREASING and ALKALI CLEANING**  
**DETROIT REX** PRODUCTS COMPANY

13015 HILLVIEW AVENUE • DETROIT, MICHIGAN

Branch Offices in Principal Cities of U. S. A. — In Canada: Canadian Hanson & Van Winkle Co., Ltd. Toronto, Ontario

## SWOC Asks Vote In Steel Corp. Mills

Pittsburgh

••• The SWOC will seek labor board elections at all subsidiaries of the U. S. Steel Corp. in an effort to establish the union as an exclusive bargaining agency and will also attempt to have such elections be consent elections in order to

eliminate protracted labor board hearings, according to Philip Murray, SWOC chairman.

The SWOC will also soon invoke the 20 day clause in its contracts with U. S. Steel Corp. subsidiaries in order to set before the Steel corporation the demands made by the SWOC for \$1 a day wage increase and union security upon Bethlehem Steel Co., Republic Steel, Inland Steel and Youngstown Sheet &

Tube Co. Negotiations with those companies reached a deadlock recently and have been certified to the war labor board.

The deadlock with "Little Steel" over the question of closed shop, checkoff and \$1 a day increase and the current move of the SWOC to attempt to obtain exclusive bargaining power in the plants of the U. S. Steel Corp., as well as the demand to the Steel corporation for a checkoff union shop and \$1 a day increase are looked upon as the initial large scale drive upon the steel industry by the SWOC for a closed shop and checkoff. It is believed that the pattern will be somewhat similar to the steel "captive mine" case except that the steel companies in this instance will probably not agree to arbitration on the closed shop checkoff angle. The SWOC attempted in the past to get a closed shop and checkoff with the U. S. Steel Corp. but failed. These demands were not part of the official agenda made publicly by SWOC at the time of the U. S. Steel-SWOC wage negotiations.



That's the whole story: *turn it over and go on cutting!* Double-Life Blu-Mol, a Millers Falls exclusive, is a high-speed machine blade with teeth on *both* sides. Special set differential eliminates drag and wear on the trailing edge; special heat treatment, leaving edges *hard* and ends and center *soft*, makes it *super-tough*. Priced only 50% higher, this blade will give you *twice* the service of the best single-edged molybdenum blade you've ever used . . . proved in hundreds of shops nationwide.

### Try This Blade

In the interest of *your own business* (cost cutting, efficient operation) and of *America's war effort* (savings in steel consumption, shipping, storing, handling) *determine DOUBLE-LIFE'S value for your needs*. Put in a requisition now. Savings begin at once.



### IT WORKS THIS WAY:

Place in machine in usual way, first edge (A) down. As blade submerges in slot, edge B, set narrower than edge A, clears work freely, undamaged. When A is dulled, invert blade. Edge B then cuts as fast and free as first edge.

# DOUBLE-LIFE Hack Saws

MILLERS FALLS TOOLS DEVELOPED • PERFECTED • MANUFACTURED ONLY BY  
**MILLERS FALLS COMPANY**  
GREENFIELD, MASSACHUSETTS • U.S.A.

## SWOC Loses Scullin Election

St. Louis

••• The Independent Steel Workers Organization won over the CIO Steel Workers' Organization by a vote of 1033 to 495 at an election conducted by the National Labor Relations Board at the plant of Scullin Steel Co. to decide the bargaining group. Of the 1776 employees eligible to vote, 1591 cast ballots, 38 being for neither union, 24 void and one blank. The CIO will protest the election, according to A. F. Kojetinsky, regional director.

## Cleveland Ordnance Executive Promoted

Cleveland

••• H. M. Reedall, director of procurement and production of hundreds of millions of dollars worth of ordnance for the army, has been promoted to the full rank of a colonel, marking the second time his rank has been raised within the past year. Colonel Reedall is the executive officer and guiding power of the War Department's Cleveland Ordnance District, which includes north and central Ohio and part of western Pennsylvania.





COAL EXECUTIVE: W. F. Schulten (above), has been appointed assistant to the president of Pittsburgh Coal Co.

### Order Limits Uses of Madagascar Graphite

Washington

... Announced on Tuesday by J. S. Knowlson, director of WPB's Division of Industry operations, Order M-61 prohibits the use of Madagascar graphite except for the manufacture of crucibles for the war effort only. After Feb. 23 crucible cannot be made of this imported material except upon specific authorization. The order is not retroactive in this regard and manufacture started before the effective date can be completed.

The order makes the Metals Reserve Co. sole importer of the crucible grade of Madagascar flake graphite. Manufacturers must apply monthly on Forms 303-A and 303-B for specific authorization to make crucibles and suppliers to make deliveries which the manufacturer is authorized to receive. Army, Navy and other governmental contracts are exempted from the restrictive provision of the order.

### Shot and Bullet Core Steel Put Under Allocation

Washington

... Effective immediately, a complete allocation system for shot and bullet core steel was set up in Order M-21-F, issued on Tuesday. The purpose is to stop over-buying and to reduce excessive inventories of this special type of steel, which calls for unusual hardening and

extra time in its manufacture.

The order applies to steel for 20, 37, 40, 57 and .75-m.m. and 3-in. armor piercing and semi-armor piercing shot and to .30 and .50 cal. bullet cores.

Beginning March 1 no producer of shot and bullet core steel shall make delivery of any such material and no person shall accept delivery from a producer except pursuant to an allocation order issued on Form PD-201.

## The Most Efficient Way TO CLEAN METAL PARTS !



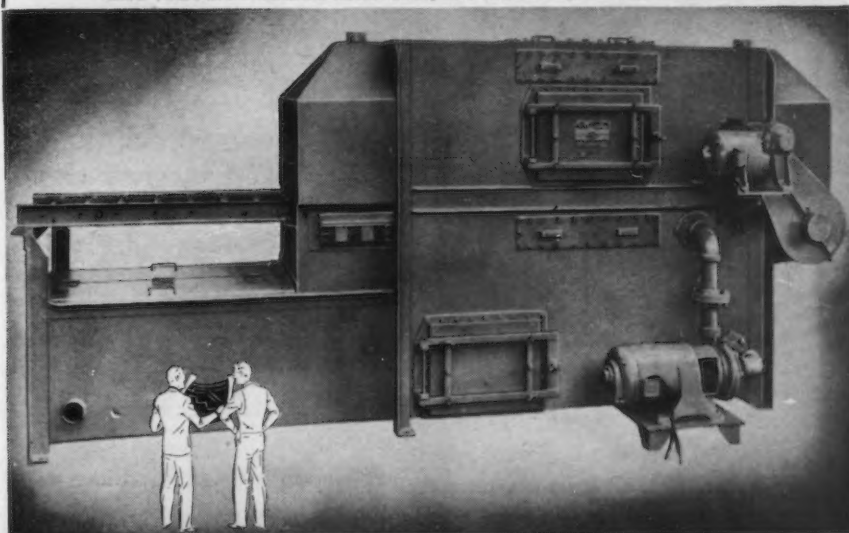
**FASTER CLEANING** before and after heat treating . . . A lower-cost cleaning agent . . . No toxic effects . . . A surprisingly large saving in washing solution gallonage . . . All these important advantages and many others are yours with an Alvey-Ferguson Metal Products Washing Machine!

Whatever the size and shape of your parts or products,

whatever the problem—washing, rinsing, drying, soaping, rust proofing, oil slushing—you can do it more efficiently and save money over a longer period of time with Alvey-Ferguson equipment.

Write or wire for a discussion of your cleaning problems without obligation on your part. Or write today for our new "Washing Machine Handbook and Engineers' Guide."

The ALVEY-FERGUSON CO., 711 Disney St., Cincinnati, Ohio



**ALVEY-FERGUSON**  
PRODUCT WASHING MACHINES  
AND *Conveyors*

## Price Roundup

(CONTINUED FROM PAGE 104)

feature is a provision that sales by retail dealers of nails in quantities of less than 25 kegs or other merchant wire products in quantities of less than 2500 lb. as well as five standard lengths or less of pipe are not covered by the schedule.

The effect of this amendment will

be to remove the price limitations on sales essentially at the retail level, while maintaining a reasonable price level for those sales by any person whose operations are similar to or the same as sales by jobbers.

OPA emphasized that sales to industrial consumers in large quantities by any person still are covered by the schedule. Sales even in

small quantities by steel warehouses and by reconditional jobbers and wholesalers also still are covered.

Galvanized sheet roofing also generally handled in retail quantities by the same small dealer operating in merchant wire products is included in the merchant wire product limitations.

Sellers must do \$100,000 gross business annually before it becomes necessary to file prices with OPA. Previously \$50,000 gross business required file reports.

However, the new amendment reiterates the previous interpretation that prices must be filed even if only part of this business is done in iron and steel products. If all the business in iron and steel products is done in quantities to which the schedule's price provisions do not apply, no files need be made.

Another feature covers those merchant wire products for which specific markups are provided. The maximum delivered price anywhere other than the city or free delivery area in which the seller is located, is the seller's own country price, as established under the markup computation, plus the less than carload freight rate to destination. This removes the "lowest combination" limitation on such sales, although on these specific sales only. However, OPA quarters feel that the specific price for these products will prevent extortionate prices on sales in places other than the seller's own city.

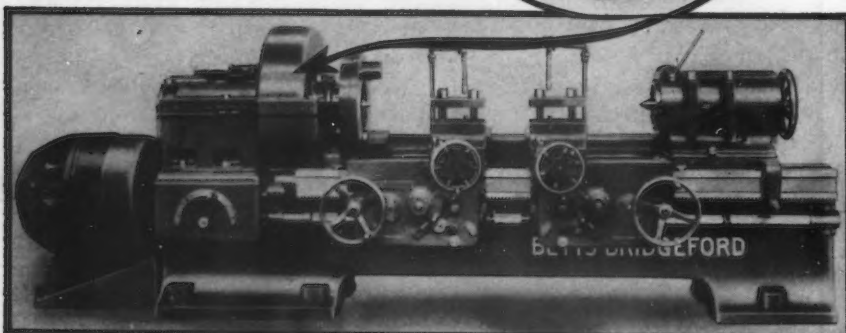
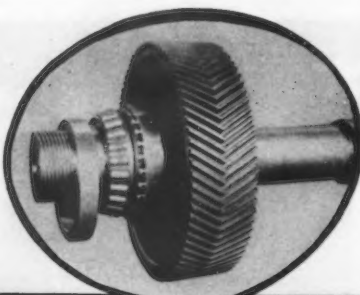
The new amendment also contains a clause authorizing OPA to issue published price lists for specific cities. Such lists shall replace the "published listed prices" of sellers named in such cities under the present schedule, when issued. Publication of these lists will await only the check up of prices now being filed for the various cities.



## Byproducts Meetings

• • • Price increases during the last year in certain of the distilled fractions of coal tar caused OPA to issue calls for three industry conferences on Tuesday, Wednesday and Thursday of this week in Washington. Producers and resellers were asked to attend. Proposals

## FARREL-SYKES Herringbone Gears Drive Betts-Bridgford End-Drive Axle Lathe



Built for long-lived accuracy and durability in the heavy-duty service of rough and finish turning of locomotive axles and similar heavy forgings, the Betts-Bridgford End-Drive Axle Lathe is driven by Farrel-Sykes Continuous Tooth Herringbone Gears.

The Consolidated Machine Tool Corporation has designed this lathe with special features to eliminate the chief causes of inaccuracy in heavy duty lathes of standard design. Consolidated's choice of Farrel-Sykes Herringbone Gears is based upon their record for dependable performance, smoothness of operation and long life under the most severe operating conditions.

Farrel-Sykes Gears are proportioned for extra strength and load-carrying capacity to withstand shocks, stresses and wear. The combined characteristics of overlap or interlacing of the teeth, gradual engagement and inclined line of pressure contribute to smooth, quiet operation and maintenance of correct tooth action throughout the life of the gears.

Farrel-Sykes Gears are designed for all types of machine tool applications. In adding improved features to your machines we invite you to consult Farrel engineers on specific problems involving gears.

**FARREL-SYKES GEARS**  
**FARREL-BIRMINGHAM COMPANY, Inc.**  
333 VULCAN STREET - - - - - BUFFALO, N. Y.  
*The Gear with a Backbone*



to establish maximum prices will be made.



### Another Relaying Rail Change

• • • In amendment No. 2 to Price Schedule 46 (Relaying Rails) Minneapolis, Minn., has been revoked as a base point and Duluth, Minn., has been substituted for it. This change is effective as of Feb. 6.

### Studebaker Output Switches Quickly to War

South Bend

• • • Studebaker Corp., which suspended manufacture of passenger cars only in early February, announced Feb. 16 that it is already utilizing some of its passenger car manufacturing facilities for the production of war materials such as heavy-duty military trucks. H. S. Vance, chairman of the board, revealed that Studebaker is currently negotiating with the government for contracts on armament items and is listing all of its machines and machine tools with the Automotive Council for War Production.

### Michigan Has Space, But No Machines for Training

Detroit

• • • With every school machine shop in Michigan utilized to capacity, the State Board of Control for Vocational Education reports it has not been able to find machine shops or welding plants which might be rented for training of workers. "There is plenty of floor space available for training shops but no machines," according to George H. Fern, director of the program.

### Hot Dip Galvanizers In Annual Meeting, Feb. 26

Pittsburgh

• • • The American Hot Dip Galvanizers Association, Inc., will hold its annual meeting at the William Penn Hotel, Thursday, Feb. 26. The technical session will begin at 10 a.m. with various papers and it is expected that WPB officials will speak. Stuart J. Swensson, American Bank Bldg., Pittsburgh, is secretary.

### Cadillac Permitted to Finish Ambulance Chassis

Detroit

• • • Permission has been granted to Cadillac to complete production of 719 special ambulance chassis. WPB in granting permission said Cadillac had sufficient parts on hand to complete production. The chassis will be distributed among nine manufacturers of ambulance bodies.

### General Fireproofing Profits

Youngstown

• • • General Fireproofing Co. earned \$1,527,715, or \$4.45 a common share, after paying 1941 taxes of \$2,630,000. This compares with 1940 earnings of \$1,099,119, or \$3.25 a common share, after taxes of \$780,000. To offset the shortage of steel, and other metals, the company has added a line of wood files and will soon add wooden desks.

## This is their big BENDING moment—

THEY look like gracefully curved fencing foils—but these four lengths of wire are being subjected to the Rotating Beam Fatigue Test in the Hunter Laboratory. Specimens from a coil of wire are bent at various radii and whirled at a controlled speed for hours . . . even days . . . until they fail . . . or reveal their actual endurance values.

Tests on every conceivable spring material have been made by Hunter, including important studies on the effect of various heat treatments, sur-

face finishes and electroplating. These tests, correlated with fatigue tests on actual springs, provide a wealth of valuable spring design data for use by our engineers.

Along with this research work additional fatigue "heads" are in constant operation, making routine checks on the uniformity of the fatigue resistance of materials received from the various approved sources . . . an unusual but very effective adjunct to the many other tests required for maximum quality control of springs.



HUNTER PRESSED STEEL COMPANY, LANSDALE, PENNSYLVANIA

## Navy Contracts

• • • Below is a list of Navy Contracts recently awarded. If you are interested in getting part of this work on a subcontract basis, write, don't telephone, your nearest WPB Contract Distribution office. In making inquiries concerning any of the following items, please refer to the letters and numbers given in the second

column. It is WPB policy not to publish names and addresses of firms holding war contracts.

Contract Item	Firm
Trucks, now	NAJ-3019
Tools	NAJ-3101
Tractors	NAJ-3104
Lockers	NAJ-3106
Diesels	NAJ-3109
Building, prefabricated	NAJ-3111
Steel, bunks	NAJ-3113
Machines	NAJ-3114
Padlocks	NAJ-3115
Buckles	NAJ-2118
Connectors, solderless	NAJ-3125
Lockers	NAF-103

**FAST FLEXIBLE HEATING SYSTEMS**

**AIRPLANE PARTS MANUFACTURING**—Five Direct Fired Heaters used for main room offices and laboratories. Duct system, special air filters for pure air feature this installation.

**MACHINE SHOP**—L shaped, cubic content of 930,000 cu. ft. Heated with four Direct Fired Heaters. Ducts deliver heat at machine tool stations, maximum efficiency, minimum cost.

**ORDNANCE PLANT**—roughly 12,000,000 cu. ft. 22-1,000,000 B.t.u. Direct Fired Heaters maintain temperature with practically no variation in working area. Remarkable in a 70 ft. high building.

**STEEL COMPANY**—81,000 sq. ft., including offices. Eight Direct Fired Heaters each 1,250,000 B.t.u. installed in space saving "dog house" maintain 70 deg. temp. at outside 0 deg.

NO matter what the size or shape of a plant or plant extension you are building, here is an efficient heating system that can be installed quickly and started up immediately. Aside from these hurry up advantages this system has been proven to be low in both first price and operating costs!

Dravo Direct Fired Heaters can be spotted around the building so as to provide the required working temperatures in all sections. They can be moved from place to place, or even from building to building. Each has a self-contained firebox with heat transfer efficiencies of about 85%, operating either on gas, oil or coke oven gas.

This type of heater can be delivered and connected during the building construction for use as temporary heat, then retained as a permanent system. The total cost of a complete system is usually less than a central heating plant. No skilled attendant is required.

## DRAVO CORPORATION

Machinery Division Heater Department  
DRAVO BUILDING · PITTSBURGH, PA.  
4800 Prospect Ave. Broad St. Station Building  
Cleveland Philadelphia



For a quick check-up, why not refer to our 12-page catalog in Sweet's, or if you don't have Sweet's, write or wire and we will send you complete information.

Contract Item	Firm
Engines, diesel	NAF-104
Compressors, air	NAF-107
Machines	NAF-109
Lathes	NAF-307
Motor generators	NAF-312
Fire engines	NAF-313
Boilers	NAF-315
Davits	NAF-316
Supplies	NAF-317
Fans	NAF-318
Generators	NAF-319
Instruments	NAF-320
Beds, hospital	NAF-321
Pumps, fuel	NAF-322
Tubes, condensers	NAF-323
Gaskets, general	NAF-324
Rope, wire, steel	NAF-325
Reduction gears	NAF-327
Steel, sheet	NAF-328
Trucks, motor	NAF-331
Lockers	NAF-332
Lockers	NAF-333
Lockers	NAF-334
Lockers	NAF-335
Machines	NAF-337
Fans, ventilating	NAF-338
Steel tanks	NAF-501
Material, insulating	NAF-503
Machinery	NAF-504
Fittings	NAF-505
Units	NAF-506
Altimeters	NAF-508
Generators	NAF-509
Manifold pressure gages	NAF-510
Hose oil discharge	NAF-511
Fans	NAF-512
Regulators	NAF-513
Forgings	NAF-601
Helmets	NAF-702
Helmets	NAF-703
Trunk lockers	NAF-709
Alloy, aluminum	NAF-710
Lead pig	NAF-711
Cork, compressed	NAF-713
Shackles	NAF-714
Welding sets	NAF-715
Repairs	NAF-717
Busses	NAF-718
Aluminum alloy	NAF-719
Aluminum alloy	NAF-720
Trucks, motor	NAF-721
Lighters	NAF-722
Cranes	NAF-723
Lighters	NAF-724
Engines, diesel	NAF-725
Handles	NAF-726
Pumps, fuel	NAF-727
Cranes	NAF-728
Diesel generator sets	NAF-729
Cable	NAF-730
Chain, crane	NAF-731
Pumps, portable	NAF-733
Floats, life	NAF-734
Life nets	NAF-735
Floats, life	NAF-736
Radial drills	NAF-737
Trucks, motor	NAF-738
Trucks, motor	NAF-739
Cloth	NAF-740
Machines	NAF-741
Spare parts	NAF-742
Spare parts	NAF-744
Shovel	NAC-6601
Drilling machines	NAC-6602
Shears	NAC-6603
Brass heads	NAC-6604
Magazine padlocks	NAC-6605
Needles	NAC-6607
Testers	NAC-6608
Bus bars	NAC-6609
Taps	NAC-6610
Bearings for Arno gyro compass equipment	NAC-6611
Jackknives	NAC-6612
Steel billets	NAC-6613
Marine cable	NAC-6701
Pipe tape	NAC-6702
Pressure gages	NAC-6703
Power press	NAC-6704
Fuel oil heater	NAC-6705
Commercial brass plates	NAC-6706
Bench type drill	NAC-6707
Heavy duty pedestal grinder	NAC-6708
Motor driven squaring shear	NAC-6709
Cable	NAC-6710
Brass	NAC-6711
Motor trucks	NAC-6712
Jackknives	NAC-6713
Copper tubing	NAC-6801
Pressure gages	NAC-6802
Saws	NAC-6806
Pig iron	NAC-6807
Machinery steel	NAC-6808
Drawers	NAC-6809



Contract Item	Firm
Rotary switch parts .....	NAC-6810
Unit X-Ray complete .....	NAC-6811
Three-way switches .....	NAC-6812
Transformers .....	NAC-6813
Cylinder-boring portable machine .....	NAC-6901
Parts for air compressor .....	NAC-6902
Direct current motors .....	NAC-6903
Oscillating force pumps .....	NAC-6904
Shore-use wire .....	NAC-6905
Suction hose & discharge hose .....	NAC-6906
Gaskets .....	NAC-6907
Copper seamless tubing .....	NAC-6908
Bronze tube-steel tube .....	NAC-6909
Magnetic Contactors & spare parts .....	NAC-6910
Bolts, nuts, etc. ....	NAC-6912
Racks .....	NAC-6913
Drawers .....	NAC-6914
Welding sets .....	NAC-7001
Cylinder heads, gaskets, crank- shaft, etc. ....	NAC-7002
Type 12 RVG Univ. R.A. drive speed reducer units .....	NAC-7003
Punch, shear & bar cutter machine. ....	NAC-7004
Cylinder, connecting & fuel nozzle parts .....	NAC-7005
Parts for Sperry gyro compass equip. ....	NAC-7006
Macomb strainers, composition, complete .....	NAC-7007
Parts for teletype type-bar .....	NAC-7008
Electric cable .....	NAC-7009
Trolleys .....	NAC-7505
Pumps .....	NAC-7506
Band saws .....	NAC-7508
Investigator Magnetic Pioneer, complete PBX-149 .....	NAC-7509
Drilling machine .....	NAC-7510
Steel bars .....	NAC-7512
Drilling machines .....	NAC-7601
Ratchets .....	NAC-7605
Tubes .....	NAC-7606
Hack saws .....	NAC-7607
Countersinks .....	NAC-7608
Mechanical cow .....	NAC-7609
Motor spares .....	NAC-7610
Cranes .....	NAC-7611
Motor spares .....	NAC-7701
Steel bars .....	NAC-7704
Solder pots .....	NAC-7705
Steel bars .....	NAC-7708
Drilling machine .....	NAC-7709
Balancing machine .....	NAC-7710
Electric kettles .....	NAC-7711
Dental X-Ray units .....	NAC-7712
Combination punch, shear & coper machine .....	NAC-7801
Spare parts for L.P. ballast pump motor .....	NAC-7804
Parts for Worthington pump .....	NAC-7805
Snow plow .....	NAC-7808
Replacement parts for gas ranges. ....	NAC-7810
Brass tees & steel nipples .....	NAC-7811
Sewing machines .....	NAC-7812
Cylinders .....	NAC-7012
Steel bar .....	NAC-7013
Overbed tables .....	NAC-7201
Cuspidors .....	NAC-7202
Armature, coils, bearings, etc. ....	NAC-7204
Gate valves & globe stop valves .....	NAC-7206
Transfer panels for Sperry gyro <sup>®</sup> compasses .....	NAC-7207
Tube, cutter tool set, etc. ....	NAC-7208
Lathes .....	NAC-7210
Drill .....	NAC-7211
Gaskets .....	NAC-7212
Drill pointer .....	NAC-7301
Overbed tables .....	NAC-7302
Spare parts for Atlas Imperial diesel engine .....	NAC-7303
Drill .....	NAC-7304
Special steel olive green tables .....	NAC-7305
Steel bars .....	NAC-7306
Magazine padlocks .....	NAC-7307
Engine spares .....	NAC-7309
Valves .....	NAC-7310
Cylinder heads .....	NAC-7311
Gages .....	NAC-7312
Commutator transmitters .....	NAC-7401
Flame softening head .....	NAC-7402
Combination punch & shear machine .....	NAC-7403
Dental instrument cabinet .....	NAC-7404
Piston ring, wrist pin, etc. ....	NAC-7407
Tube fittings .....	NAC-7409
Pressing machines .....	NAC-7410
Spare parts for Sterling Admiral engines .....	NAC-7411
Buttons .....	NAC-7412
Anchor buttons .....	NAC-7501
Anchor buttons .....	NAC-7502
Socket head, wrenches & cap screws	NAC-7503

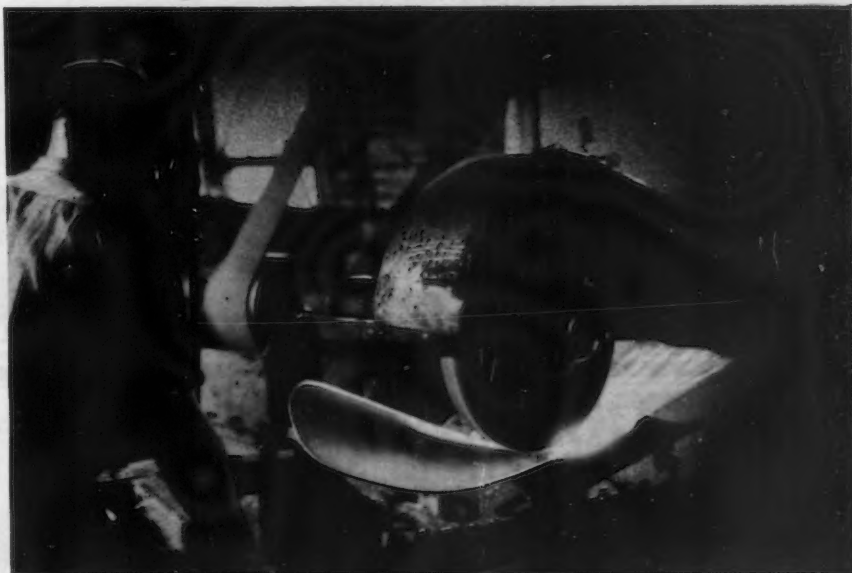
## Allegheny Ludlum Nets \$5,062,709 for Year 1941

Pittsburgh

••• In a preliminary report for the year 1941, Allegheny Ludlum Steel Corp. announced consolidated net profit of \$5,062,709, after all charges and provision of \$9,700,000 for Federal income and excess profits taxes, equivalent to

\$3.86 a share of common stock after providing for dividends on the preferred stock. This compares with a net profit of \$3,722,107 or \$2.78 a share in 1940. For the fourth quarter of 1941, net profit was \$1,073,473, after provision for taxes, equivalent to 82c. a share, compared with \$940,822 profit in the corresponding 1940 period, after provision of taxes, equal to 70c. a share.

## WE STILL NEED PLOWSHARES



Although we're straining every resource to build guns, tanks and planes faster and better than ever before, we still have to have plowshares. For America's farms are called upon to produce food in unheard of quantities. Our Armed Forces and those of our Allies, as well as a large part of the world's civilian population are depending on us.

And General Abrasive's NB Lionite is playing an important part. It is the abrasive grain used for polishing plowshares in the plow shops of the United States and Canada. NB Lionite is a tough, hard grain that works exceptionally well with cements. Recent tests in plants using cements have shown production increases of from 25% to 100% when they changed to NB Lionite. When you get more pieces per wheel you not only speed up production but you also conserve important defense materials. Put NB Lionite to work in your plant.

SALES REPRESENTATIVES in All Principal Cities

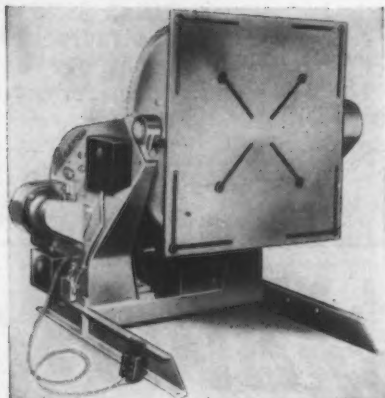
**GENERAL ABRASIVE CO., INC.**  
**NIAGARA FALLS, NEW YORK U. S. A.**



# TANK AND ANTI-AIRCRAFT GUN PRODUCTION MOVES MUCH FASTER WITH *Ransome* WELDING POSITIONERS

Now being used in producing

TANKS—  
ANTI-AIRCRAFT—  
GUN MOUNTS—  
ARMOR PLATE—  
NAVAL GUN MOUNTS—  
NAVAL VESSELS—



in  
SHIP YARDS—  
ARSENALS—  
PIPE WORKS—  
CHEMICAL PLANTS—  
OIL REFINERIES—  
and throughout industry

Indicative of the essential part Ransome Positioners are playing in the defense effort is the above list of items now being produced on these machines.

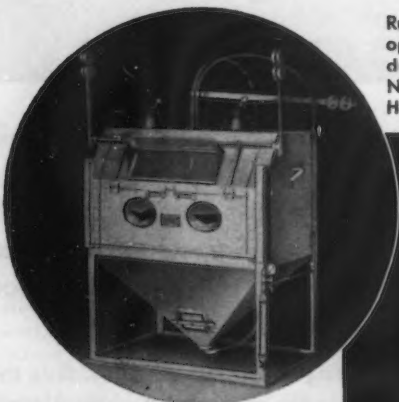
Bulletin No. 200-A is yours for the asking.



Industrial Division  
**RANSOME CONCRETE MACHINERY COMPANY**  
Dunellen, New Jersey



## SAND BLASTING *Made Easy* for Defense Production!



### RECOMMENDED FOR:

1. Heat treating plant—removing scale, oxides.
2. Aircraft production—cleaning welds, metal preparation.
3. Foundries, ferrous and non-ferrous—cleaning castings.

**RUEMELIN MANUFACTURING CO.**  
3960 N. Palmer St • Milwaukee, Wis.

Ruemelin Sand Blast Cabinets put blast cleaning operations on a faster, more efficient basis. Eliminate dust, permitting installation anywhere in the plant. No skilled labor required. Sturdily constructed. Handles sand or steel abrasives. Prompt delivery.



Ruemelin cabinet with door open. Provides quick access for loading and unloading.

## RUEMELIN Blast Cleaning Cabinets

NEWS OF INDU

### Survey Shows Cleveland Small Businesses Lack War Work

• • • Despite Federal exhortations that small business enter into the war effort, and attempts to enlist the smaller concerns into this work by subcontracting, a survey by the Cleveland Chamber of Commerce of 165 small factories in this area reveals that only 14 are 100 per cent on war work. Out of 261 plants surveyed, 165 reported they were producing parts and materials under war subcontracts, but only 27 of these firms said they were operating at full capacity, while but 14 of these were entirely on war work. It is also significant to note that the 14 small plants engaged 100 per cent in war work are only averaging 18 hours a day, 6.1 days a week and three plants with 97 per cent capacity in war work are operating only 11.3 hours a day, 5.3 days a week. Breakdown of the 27 companies now handling all the war work for which they have facilities is as follows:

No. Cos.	% War Work	Hours a Day	Days a Week
14	100	18.0	6.1
2	99	14.5	6.0
1	97	10.0	5.0
3	95	13.3	5.7
3	90	11.3	5.3
1	85	20.0	5.5
2	80	16.0	5.7
1	70	20.0	6.5

### Republic Votes Dividends

Cleveland

• • • Directors of Republic Steel Corp. declared a dividend of \$1.50 per share on the 6 per cent cumulative convertible prior preference stock, Series A, and a dividend of \$1.50 per share on the 6 per cent cumulative convertible preferred stock, payable April 1, 1942, to stockholders of record March 9, 1942. The directors authorized the setting aside on April 1 of \$300,000 to purchase fund for purchasing 6 per cent cumulative convertible preferred stock, in accordance with the company's Certificate of Incorporation, as amended. At the same time a dividend of 50c. per share was declared on the common stock, payable April 2, 1942, to stockholders of record March 9, 1942.



**Book on Die Designing  
And Estimating Revised**

*Cleveland*

••• Based on earlier published data on die design by Charles Bohmer and on die estimating by George Dannes, a new book has just been published by the American Industrial Publishers, 2460 Fairmount Boulevard, Cleveland, under the title, "Die Designing and Estimating." The new text of 160 pages is considerably longer than what appeared in the separate first editions, and two entirely new chapters on progressive dies and drawing dies have been added.

Most of the latter chapter is given over to detailed analysis of the design of small caliber cartridge dies, including mathematical and graphical methods of determining diameters and wall thicknesses. The material was supplied from a leading manufacturer of shell cases and the Frankford Arsenal. Many other specialists have also contributed to a section on "Practical Points on Die Design and Construction."

The part of the book devoted to die estimating is full of charts and tables giving hourly working estimates for the manufacture of most die elements encountered in practice. This section of the book is intended to be helpful to both contract die shops and production plant toolrooms. The whole treatment is practical in character. The volume sells for \$3, plus postage.

**Detroit Plating Firms  
Discuss Pool Plan**

*Detroit*

••• Plating and rust proofing plants in Detroit are seeking some way to avoid extinction that is threatened because of the war ban on civilian production. Representatives of 19 of these firms met in Detroit last week to discuss a pooling plan which would keep 1000 skilled employees at work. A committee appointed to work out details of the pooling system with H. B. White, contract distribution branch of the War Production, consists of C. S. Slack, secretary-treasurer of the Detroit Plating Industries, Inc.; Percy L. Stapleton, owner of the Service Plating Co., and James Malone, sales manager of United Platers, Inc.

# PERFORATED METAL

INDUSTRIAL and

ORNAMENTAL

INDUSTRIAL PERFORATIONS include round, square and special shaped perforations as used in mechanical arts. Our line is comprehensive.

ORNAMENTAL PERFORATIONS as used in architectural grilles, metal furniture, enclosures, cabinets, stoves and for ornamentation. Many attractive and exclusive patterns.

H & K workmanship is unsurpassed.

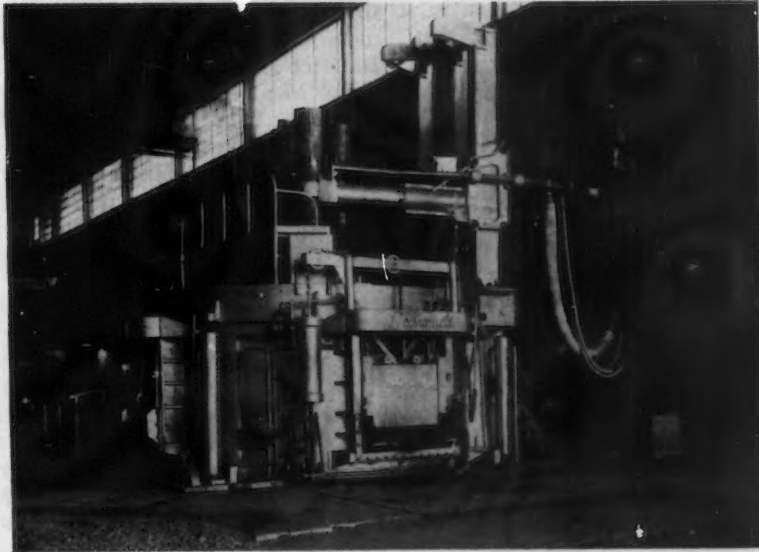
**Any Metal  
Any Perforation**

*The*  
**Harrington & King**  
PERFORATING CO.

5657 FILLMORE STREET—CHICAGO, ILL.

New York Office: 114 Liberty Street

## THE LARGEST TOP CHARGE ELECTRIC FURNACE IN THE UNITED STATES



LECTROMELT furnaces are built in sizes ranging from 100 tons to 25 pounds. Both door charge and top charge types are available. Rugged and durable construction. Rapid and economic operation.

**PITTSBURGH LECTROMELT FURNACE CORP.**  
PITTSBURGH, PA.

# PERSONALS

• **E. E. Aldous** was elected president and a director of the Scully Steel Products Co., a U. S. Steel Corp. subsidiary; **L. B. Worthington**, was elected vice-president and a director; and **Charles B. Vernooy**, was elected comptroller, secretary and director of the company on Feb. 11.

Mr. Aldous has been associated for many years with various subsidiaries of United States Steel Corp. and previous to his election as president of Scully Steel, was manager of sales for United States Steel Corp. subsidiaries at Houston, Texas. Mr. Worthington has spent his entire business career with Carnegie-Illinois Steel Corp., a United States Steel subsidiary. Mr. Vernooy comes to the Scully Co. from the home office of American Steel and Wire Co., United States Steel subsidiary at Cleveland, where he has been staff assistant of the procedure section. **Gerald J. Stewart**, former assistant manager of the Houston district sales office of the Tennessee Coal, Iron & Railroad Co., American Steel & Wire Co., Carnegie-Illinois Steel Corp., and Scully Steel Products Co., has been appointed manager of the office, succeeding Mr. Aldous. Mr. Stewart entered the employ of United States Steel Corp. subsidiaries in 1921, as a clerk in the New Orleans sales office.

• **Harmon S. Eberhard** has been named vice-president of Caterpillar Tractor Co.; a new research department headed by **C. G. A. Rosen** has been created; **G. E. Burks**, has been promoted to chief engineer; **J. R. Munro** to general factory manager and **Charles A. Woodley** to factory manager of the Tractor division. The changes followed the sudden death, Jan. 23, of **Thomas John Connor**, vice-president.

Mr. Eberhard, who was named chief engineer in charge of all engineering activities of Caterpillar in 1933, now has administrative direction of research, engineering, manufacturing, industrial relations and training. Mr. Burks has been with Caterpillar since 1928 and in 1938 came to Peoria as assistant chief engineer in charge of engine design. Mr. Rosen became consultant to Caterpillar in 1928 and the following year joined

the company as engineer, later becoming assistant chief engineer in charge of diesel research. Mr. Munro, who takes over the top factory management job, started work as an apprentice with Caterpillar at the age of 15. He became factory manager of the entire Tractor and Engine divisions in 1936. Mr. Woodley started as an apprentice in 1926. In 1941 he was made assistant factory manager.

• **F. W. McChesney** and **Neal L. Parker**, of the General Electric Co.'s industrial department, have been appointed assistant managers of, respectively, the industrial manufacturers' section sales and the machinery manufacturers, section sales. Mr. McChesney joined the wire and cable section of General Electric's Central Station department in 1918. In 1940 he became sales engineer of the industrial manufacturers' section.

Mr. Parker joined General Electric in 1920 at Lynn, Mass., as a student in the company's electrical engineering course. Since 1937 he has been in charge of the manufacturers' section of the industrial department at New York.

• **Stevens H. Hammond**, vice-president of the Whiting Corp. has been elected a member of the executive committee. Mr. Hammond, who is 31 years old, is the son of **General Thomas S. Hammond**, who resigned as president and a director to devote his time as a civilian member of the Chicago Ordnance District staff. The younger Hammond has been with the company for more than ten years and has been in charge of the field force in recent years. Many of General Hammond's former company responsibilities will devolve upon him and he will supervise all company sales activities.

**Howard D. Grant** has been named executive vice-president and he will take over other duties of the president's office. He also has been named chairman of the executive committee, succeeding **C. Q. Wright, Jr.**, who has resigned to become naval adviser for the Illinois Contract Distribution Branch of the War Production Board.

• **Theodore C. Fedders** has been elected president and treasurer of the Fedders Manufacturing Co. of Buffalo and Owosso, Mich., to succeed his brother, the late **Louis F. Fedders**. Mr. Fedders, has been working in the plant, founded by



**E. E. ALDOUS**, president and director of Scully Steel Products Co., United States Steel Corp. subsidiary.

his father, **Theodore C. Fedders, Sr.**, since he was 15 years old. Since 1936 he has been first vice-president and general manager in charge of manufacturing and sales.

• **Roy J. Wensley**, formerly assistant general manager, I-T-E Circuit Breaker Co., Philadelphia, was recently appointed general manager of the company. Mr. Wensley came to I-T-E in 1935 after 18 years with Westinghouse Electric & Manufacturing Co.

• **Walter P. Southard**, sales representative, Cleveland office of Trundle Engineering Co., management engineers, has been appointed vice-president and will take charge of the company's New York sales office. His headquarters will remain in Cleveland and he will replace **A. Dangler**, vice-president, who is leaving the company. Mr. Southard has been with Trundle since 1936 and previously served as secretary-treasurer of the Baker-Raulang Co. and as sales manager of the Burton Explosives Co.

• **John W. Sheffer**, associated with American Car and Foundry Co. since 1908, has recently been appointed general electrical engineer of that company. He began his association with American Car & Foundry in 1908 at the Berwick plant, where he was particularly responsible for the development of the Berwick Electric Rivet Heater.





**L. B. WORTHINGTON**, vice-president and director of Scully Steel Products Co.



**HARMON S. EBERHARD**, newly appointed vice-president of Caterpillar Tractor Co., Peoria, Ill.



**NEAL L. PARKER**, assistant manager of sales, Machinery Manufacturers section, General Electric Co.

In 1926 he was transferred to the New York office.

• **Don R. Berlin**, aeronautical engineer who has just joined General Motors, will serve on the staff of O. E. Hunt, vice-president. Mr. Berlin, who designed the Curtiss P-40 pursuit plane, was formerly director of military engineering of the airplane division of the Curtiss-Wright Corp., Buffalo. His headquarters will be in Detroit.

• **Wallace G. Kileen** has been appointed comptroller of the Eastern Aircraft division of General Motors. He was formerly assistant comptroller of General Motors in charge of the central office cost section in Detroit. Prior to his appointment to that post in May, 1941, he had served as director of the cost section. The Eastern Aircraft division is now in process of organization to produce fighting planes for the Navy. It is taking over five General Motors plants, formerly used for automobile production, in New York, New Jersey and Maryland.

• **John A. Stephens**, director of industrial relations of the corporation, and **Roger M. Blough**, general solicitor, have been elected members of the board of directors, and the executive committee of United States Steel Corp. of Delaware. Before joining United States Steel Corp. at the Gary Works, Carnegie-

Illinois Steel Corp., in 1934, Mr. Stephens had had experience in industrial management. Mr. Blough practiced law with White and Case, New York, before joining the United States Steel Corp. Feb. 1.

• **James F. Towers** has been elected president of Ford, Bacon & Davis, Inc., engineers, New York. **William von Phul**, who was president from 1922 to date, will actively continue as chairman of the executive committee.

Mr. Towers started as an engineer in the operating department of Tennessee Coal, Iron and Railroad Co., at Birmingham. He was transferred to Illinois Steel Co. at Gary and in 1918 left the United States Steel Corp. to join Ford, Bacon & Davis. In recent years he has been in charge of operations. From January until May, 1941, Mr. Towers was Assistant Director of Priorities of the OPM.

Mr. von Phul started as an engineer with the Edison Electric Co. of New Orleans. In 1905 he joined the staff of Ford, Bacon & Davis and in 1912 became a partner. He was named president in 1922.

• **E. W. McNeill**, secretary-treasurer of the Ohio Seamless Tube Co., Shelby, Ohio, **H. C. Mayer**, works manager, and **Aaron Waines, Jr.**, sales manager, three long-time employees of the company, were elected on Feb. 7 to the company's board of directors.

• **Maj. Craig Miller** has been named resident representative of the Army Air Corps at the Chevrolet plants of General Motors at Buffalo, which soon will get into production of airplane motors. As a liaison officer, Maj. Miller will be the contact representative between the Air Corps and the plant management. Since April, 1941, he has been assistant inspection officer of the Central Procurement District with headquarters at Detroit.

• **Arthur T. Cox, Jr.**, has been elected vice-president of Lincoln Electric Railway Sales Co., Chicago. Prior to his election he was sales manager of Bettendorf Co., Bettendorf, Iowa. From 1936 to 1939 he was a district sales manager for the Lincoln company.

• **Donald T. McDonald** has been appointed manager of sales promotion and publicity, a newly created department of the Crocker-Wheeler Electric Mfg. Co. At present, Mr. McDonald is making his headquarters in the New York offices of the company.

• **Edward E. Butler** has been named executive vice-president of the Vinco Corp., Detroit, manufacturer of gages and machine tools. He has been engaged for 15 years in the investment banking business, principally with A. M. Kidder & Co., New York.

## OBITUARY . . .

• **Richard Williams**, erecting engineer for the Nordberg Mfg. Co., Milwaukee, died after a short illness. He was a native of Houghton, Mich., and got his first job with the Calumet Hecla Mining Co., later going with Nordberg with headquarters at Butte, Mont. He returned to Milwaukee nine years ago.

• **William J. Corbett** died Feb. 3 at his home in North Buffalo. He was vice-president and director of the Atlas Steel Casting Co. He was associated successively with the American Steel Foundries Association, the Watertown Arsenal, and in 1923 became industrial engineer for the Electric Steel Founders' Research. In 1925 he became secretary-manager of the Steel Founders' Society of America, from which position he resigned to become assistant to the president of the Fort Pitt Steel Casting Company, McKeesport, Pa.

• **Frank R. Schubert**, assistant manager of the Houde Engineering Corp., Buffalo, died Feb. 4 at his home in Kenmore, a Buffalo suburb. He was 47 years old. A native of Barberton, Ohio, Mr. Schubert was a graduate of the Case School of Applied Science. He was vice-president of the McGill Metal Co., Valparaiso, Ind., before going to the Soviet Union in 1930 to take charge of planning and equipping the First State Anti-Friction Bearing Plant of Moscow. Returning to America in 1932, Mr. Schubert became assistant to the president of the Bearings Company of America, Lancaster, Pa. He joined Houde at Buffalo in 1936.

• **Sherrill W. Ambler**, 47 years old, executive of the Army Ordnance Procurement Division and formerly associated with the Dodge Motor Co. in Detroit, died recently. Mr. Ambler for a number of years operated the Ambler Furnace & Foundry Co., Northville, Mich., but had been with Dodge for 11 years.

• **Alfred B. Moran**, representative of Eaton Mfg. Co., died Jan. 22 in Grosse Pointe Farms, Mich., aged 62 years. Mr. Moran was the son of a former president of the Peninsular Stove Co., Detroit. He was at one time treasurer of the stove company.

• **John C. Holt**, president and one of the founders of the Antrim Iron Co., died Jan. 25 in Grand Rapids, Mich. He was 85 years old.

• **Henry Steffens**, superintendent of maintenance at the Chevrolet Forge plant, Detroit, was buried Feb. 4. Mr. Steffens was 52 years old. During World War I he was in the naval aviation service.

• **Louis W. Greve**, 59, president, Cleveland Pneumatic Tool Co., died Feb. 2, in Fort Lauderdale, Fla. For many years Mr. Greve had been the president and moving spirit of the National Air Races of Cleveland, Inc., a non-profit organization. Mr. Greve's Cleveland company is heavily engaged in defense work and is a major supplier of landing gear assemblies for military aircraft. Up until a short time ago, Mr. Greve had been handling details involved in the company's steady expansion, including the current \$8,000,000 expansion program and had been working under terrific pressure for many months. Other positions Mr. Greve held at the time of his death included presidency of Cleveland Rock Drill Co., chairman of the board of Champion Machine & Forging Co. and presidency of Carey Machine Co. In the first World War he served as chairman of the pneumatic tool committee of the War Industries Board.

• **George Ashley Tomlinson**, 76 years old, former president of the \$3,000,000 Allegheny Corp., died Jan. 24 in Pasadena, Cal. Mr. Tomlinson had been in the publishing business with his father in Michigan but left to go to Duluth as a vessel agent. In 1901 he built his first vessel, moved to Cleveland and became head of the Tomlinson fleet which at one time operated 20 freighters on the lakes. In later years he headed the Van Sweringen railroad interests and the Allegheny Corp.

• **Andrew J. Weatherwax**, president and secretary of H & H Tube & Mfg. Co., Detroit, died Feb. 10 in Laredo, Tex., while returning from Mexico. He was 64 years old and had been connected with Detroit industry since 1911 when he organized the Central Distributing Co. there. He was born in Jackson, Mich., attended the University of Michigan and was graduated from West Point with a commission in 1900. His son, A. H. Weatherwax,

Jr., now heads the Central Distributing Co., of which he was founder.

• **Raymond T. Wagner**, sales manager of lightning arrester cutouts and capacitor sections of the General Electric Co., Pittsfield, Mass., died Feb. 11. He was born in Iowa 58 years ago, graduated from University of Wisconsin, was first associated with the General Electric Co. at the home plant, and went to the company's Pittsfield plant in 1905.

• **Arthur F. Porter**, formerly superintendent of several E. I. du Pont de Nemours & Co., Inc., plants died Feb. 8 at Brookline, Mass. Graduated from Massachusetts Institute of Technology in 1898, specializing in chemical engineering, he became associated with Lafin & Rand Powder Co. When that company was absorbed by du Pont he was retained, but he retired in 1922.

• **Dermot M. Hamilton**, sales representative of Roberts Brass Mfg. Co., in Detroit, died Feb. 10 of injuries received in an auto accident in Ashland, O. Mr. Hamilton was born in Detroit 57 years ago.

• **Albert H. Aldinger**, president of Waldbridge-Aldinger Co., contractors who supervised construction of several General Motors and Chrysler Corp. plants, died Feb. 9, aged 65 years. He had both bachelor's and master's degrees from Purdue University and was a fellow in Tau Beta Pi, honorary engineering fraternity.

• **George E. Howard**, vice-president and sales manager of the old Commonwealth Steel Co., now the General Steel Castings Co., Granite City, Ill., died at his home in St. Louis, recently, following a long illness. He was born 84 years ago at Wapella, Ill. He began his career in the railroad business and operated a hardware store in Wood River, Neb., before coming to St. Louis in 1890. The Commonwealth was founded by his brother, the late Clarence Howard.

• **Arthur T. Squires**, for many years sales representative of Wickwire Spencer Steel Co. and Page Steel & Wire Co., Worcester, Mass., died Feb. 8 in Chelsea, Mass. At the time of his death he was general court officer of the Massachusetts House of Representatives. He was 63 years old.



## Cast Iron Pipe

• Alexandria, La., plans pipe line extensions in water system and other waterworks installation. Cost about \$330,000. It is proposed to call special election soon to vote bonds.

Water Department, Wilmington, N. C., asks bids until Feb. 26 for about 27,530 ft. of pipe, various sizes, for extensions in water system, including valves, fittings, hydrants, etc. Also for two shallow depth-type elevated steel tanks and towers, each with capacity of 750,000 gal., including control piping, valves, etc.; and for about 1519 ft. of chain link fence around tanks and towers. William C. Olsen, 5 Exchange Place, Raleigh, N. C., is consulting engineer.

Board of Butler County Water Commissioners, Hamilton, Ohio, plans extensions in pipe lines for service in Belmont and Homewood subdivisions. Cost about \$33,600.

Orleans, Iowa, plans pipe lines for water system and other waterworks installation. Cost over \$40,000, of which about \$29,200 will be a federal grant.

Southbridge Water Supply Co., Southbridge, Mass., plans extensions in pipe lines for water service in Sandersdale and Lebanon Hill districts. Cost close to \$50,000.

Water Department, Radford, Va., closes bids March 12 for pipe line extensions in water system, including about 11,000 ft. of 16-in., 7000 ft. of 12-in., 3500 ft. of 8-in., and 2000 ft. of 6-in.; also for fittings, valves, hydrants, etc. Wiley & Wilson, Peoples Bank Building, Lynchburg, Va., are consulting engineers.

City Council, Anchorage, Alaska, will take bids soon for about 15,000 ft. for water system; also for diversion dam for water supply, 20 ft. high; 150,000-gal. elevated steel tank and tower, sluice gates, valves, hydrants, fittings, etc. Cost about \$265,000. Financing has been arranged through Federal aid. Parker & Hill, Smith Tower Building, Seattle, are consulting engineers.

Water Department, Ogden, Utah, plans pipe line extensions and replacements in water system and other waterworks installation. Cost close to \$3,000,000, including pipe lines for water supply for federal projects in vicinity of city. Fund in amount noted is being secured through federal aid.

## Pipe Lines

• Wisconsin Southern Gas Co., Burlington, Wis., plans new welded steel pipe line from connection with main system, near Lake Geneva, Wis., to point on Wisconsin-Illinois State line, close to 11 miles, for natural gas transmission.

Arkansas-Louisiana Gas Co., 300 West Capitol Street, Little Rock, Ark., plans new welded steel pipe lines from gas fields in vicinity of Macedonia and Dornat, Columbia County, Ark., to Bauxite, Ark., and Lake Catherine, near Hot Springs, Ark., respectively, about 140 miles in all, for natural gas transmission. At first noted place service will be furnished for power plant at new alumina works of Reynolds Metals, Inc., and for similar fuel service at aluminum plant of Aluminum Co. of America, Inc., at Lake Catherine, both projects of Defense Plant Corp., Washington. Lines will be 18 to 12½-in. pipe, and will have rated capacity of 81,000,000 cu. ft. per day, with booster stations and other operating facilities. Supply fields noted produce "sour" gas; a desulfurization plant will be built for purification service, as well as new gasoline extraction plant to serve both fields. A steel pipe line gathering system also will be installed. Entire project will cost about \$4,000,000, financing to be provided by Defense Plant Corp. Priorities have been secured for all features of project and work will begin soon.

Dow Chemical Co., Freeport, Tex., plans pressure pipe lines for natural gas distribution in housing development for employees at

## Weekly Bookings of Construction Steel in Tons

Week Ended	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941	Year to Date	
	1942	1942	1942	1941	1942	1941
Fabricated structural steel awards	22,900	25,000	29,000	23,850	192,550	253,400
Fabricated plate awards	350	1,810	2,500	850	5,850	23,045
Sheet steel piling awards	0	0	0	0	790	4,250
Reinforcing bar awards	36,000	9,450	28,200	6,050	256,975	70,640
Total letting of Construction Steel	59,250	36,260	59,700	30,750	456,165	351,335

local magnesium plant, including main transmission line from gas field area. Cost over \$150,000. Financing will be provided by Defense Plant Corp., Washington.

Shell Oil Co., Pocatello, Idaho, plans pressure pipe lines for high-octane gasoline transmission to new underground pressure storage tank to be constructed at local airport for airplane fueling service. Also will install pressure storage tank facilities and pipe lines for similar gasoline service at local bulk storage and distributing plant. Main offices are in Shell Building, St. Louis.

United States Engineer Office, Galveston, Tex., has low bid from Flotation Systems, Inc., 4031 Goodwin Avenue, Los Angeles, at \$114,500 for pressure pipe line system for gasoline transmission and distribution for Air Corps at Basic Flying School, Waco, Tex., including storage tanks and other facilities.

## No Unconscionable Profit In Bethlehem Ship Contracts

Washington

• • • Written by Justice Black, a 4-to-2 Supreme Court decision handed down on Monday, Feb. 16, held that Bethlehem Shipbuilding Corp. did not make "unconscionable" profits, as charged by the government, on ship contracts during the first World War. A written dissent was made by Justice Frankfurter, and Justice Douglas said from the bench that his view would require reversal of the lower court which held against the government. Chief Justice Stone and Justices Roberts and Jackson did not participate in the case.

In rejecting the government's effort to recover \$8,000,000 paid to the shipbuilding corporation, the court said there was no fraud on the part of Bethlehem in negotiating the contracts.

The case centered around the "bonus-for-savings" provision of the contracts, which the Supreme Court declared was valid.

In declaring the company's profits were not unconscionable, the court said:

"If profits earned under government contracts in general are taken as the standard of comparison, the 22 per cent claimed here is over-

shadowed in too many instances for it to be regarded as extraordinary."

Justice Murphy said that his concurring vote should not be construed as an approval of 22 per cent profit on war contracts.

## War Brings Profits

Tiffin, Ohio

• • • The Webster Mfg. Co., 99 per cent on war production since last January, reports that its last fiscal year was the first profitable one since the company's organization in 1937. The concern is now turning out castings and forgings for tanks and manufacturing snowplows for army use.

## Trade Notes

New England Lime Co. has been authorized by the Defense Plant Corp. to construct a magnesium plant either at Adams, Mass., or Canaan, Conn., and funds have been earmarked for the project.

Wellman Engineering Co. has moved its Chicago office to Room 1112, Merchandise Mart, 222 West North Bank Drive. John E. Carlson of the Williams Bucket Division of Wellman is in charge of bucket sales.

F. Krause & Co., die manufacturers, have moved their office and factory from Jersey City to 202 Pennsylvania Avenue, Hillside, N. J.

Copperweld Steel Co.'s Chicago district office has been moved to 122 S. Michigan Avenue.

Mullins Body & Tank Co., 2081 S. 56th St., Milwaukee, has changed its name to Milwaukee Welded Products, Inc.

Consumers Pipe Co., Inc., Detroit, has changed its name to Copco Steel & Engineering Co.

Maris Brothers Crane Co. has been acquired by Atlantic Structural Steel Co., 56th and Grays Avenue, Philadelphia, and will be known as that company's Maris Brothers Crane Division.

Fichter Steel Corp., New York, has moved its offices to 60 East 42nd Street.

Pomona Pump Co., manufacturer of vertical pumps, announces acquirement as of Feb. 1 of Micro-Westco, Inc., of Bettendorf, Iowa.

# MACHINE TOOLS

... SALES, INQUIRIES AND MARKET NEWS

## Resourcefulness Being Shown In Machine Adaptations

Cleveland

... Machine tool users with the cooperation of resourceful dealers have been adapting certain machines to uses for which they were not originally intended by making certain attachments and other adjustments. In many cases, this has permitted plants engaged upon important war work to secure machines more easily available than those in the greatest war demand and place them into production to do abnormal operations within a very short time. Among several cases which have come to the attention of THE IRON AGE are included one in which an old lathe equipped with an attachment costing about \$700 was able to perform work ordinarily done on an automatic profiling lathe. In another case, a boring mill also equipped with an inexpensive attachment was able to perform the work normally requiring a Keller machine to do. There have been many other cases where milling machines have been converted in groups to do the work of special type machine tools, which were hard to obtain.

Rumors that machine tools would be entirely allocated by early March were not particularly disturbing to the machine tool industry as a whole, in view of the fact that a good amount of allocations has been done by the government in the case of the vital machine tools, through the medium of special emergency orders or the "urgency standing" list. However, some observers doubted that the allocations to be imposed upon the industry would cover all types of machines. These industry representatives were of the opinion that allocations would merely be instituted in the more vital lines in greatest demand for war work.

## Backlogs Continue to Rise

Cincinnati

... The machine tool demand seems to be bottomless. With the industry producing many times what had been thought to be its maximum capacity and with further increases being recorded currently, no great reduction of backlogs is noted. Inquiries and requests for quotations continue to flow in at a pace indicating the still unplaced orders to be sufficient to keep the industry in oper-

ation at full capacity well into the next year and perhaps beyond. The majority of the district factories are now operating on a 24-hr. basis, but with the difficulty of getting workers, the three daily shifts are not being fully manned. To relieve the personnel situation, the local public schools have expanded their learner programs as a further aid to increasing production throughout the trade in this area.

## Buying Activity at Flood

Chicago

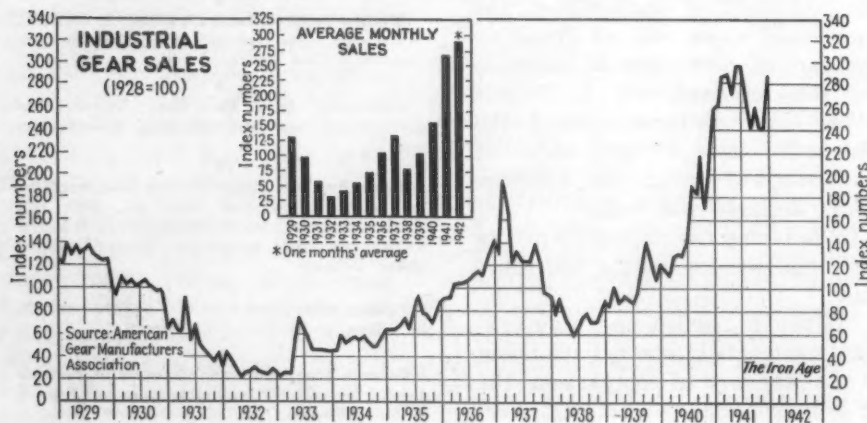
... Buying activity in this section is at flood-stage, with equipment purchases for tank and shell manufacture being underlined. The huge requirements on tanks of International Harvester are coming out, as are those for John Deere. Expected very soon are the orders from Massey-Harris, another farm implement manufacturer and the latest recipient of a big tank contract in the area. The Harvester project, which will embrace literally hundreds of subcontractors (as will the others, proportionately) will bring heavy purchases of new tools from these sources, too.

The new torpedo plant located in Greater Chicago is under construction and equipment orders are being released now. Link-Belt's new ordnance company is buying for gun mounts. No slackening in orders for shell production is seen as this area gets more and more orders in this line.

Machine tool manufacturers in the section are working maximum shifts wherever possible. Greater emphasis is being placed on women training. The big problem in this direction is still manpower.

## Industrial Gear Sales Gain—January

INDUSTRIAL GEAR sales in January showed a gain of 18.5 per cent above December, and 11.2 per cent above January, 1941, according to the index compiled by the American Gear Manufacturers' Association. The association's index for January stood at 288, as compared with 243 in December and 259 in January, 1941. The January index compares with 299 in June, 1941, the highest level recorded. The index does not cover automotive or high speed turbine drive gears.



## Gear Makers Meet May 11 to 13

... The American Gear Manufacturers Association will hold its 26th annual convention at the Hotel Hershey, Hershey, Pa., May 11, 12 and 13. J. C. McQuiston, secretary, has announced.



# NON-FERROUS METALS

... MARKET ACTIVITIES AND PRICE TRENDS

## ALCOA Asked to Boost Wages in South

• • • Higher wages have again become the chief topic of discussion in current activities of the non-ferrous industries. The Aluminum Co. of America has been requested by the National War Labor Board to increase its basic hourly rate in the southern states by 7c. an hr., thus lowering the differential between the levels of the North and South. Passed by a 7 to 4 vote, the recommendation was made by the dissenting voters for a compromise. The new rates in the South are now 62c. per hr., compared with a minimum of 75c. and 73c. an hr., at Edgewater, N. J., and New Kensington, Pa., respectively. The decision will affect about 9000 workers.

Meanwhile, it was reported that a committee of workers of the American Brass Co., at Waterbury, Conn., conferred with executives of the firm for higher wages on Wednesday, following the announcement of a 6c. an hr. wage boost last Friday by Scovill Manufacturing Co. Union representatives of the Chase Brass & Copper Co., indicated they would renew efforts to negotiate a wage increase in the Chase plants, although efforts have been rejected recently. The Wednesday meeting of the American Brass Co. workers and the management is expected to mark the beginning of negotiations for a new contract to replace the one now in effect which expires March 17. The union will ask for a 15c. an hr. increase. The Scovill raise, affecting about 9000 workers, is the third increase in a year, bringing hourly earnings for the period up 14c. The union indicated, however, that the most recent increase was insufficient and that it would campaign for a "much more substantial increase."

Naturally, primary interest of non-ferrous metal producers was centered on the joint WPB-OPA statement of the rules and regulations that will govern the over-quota production premiums of zinc, lead and copper. There are five distinct classes of quotas upon which premium prices will be paid, namely: zero, intermediate, 100 per cent, specials between zero and 100 per

cent, and specials in excess of 100 per cent. The zero quota sets a 200-ton maximum production for 1941 as the basis upon which premiums may be obtained by increased production. The intermediate quota is for production between 200 and 600 tons, and the 100 per cent quota is for production over 600 tons. Should a property fail to maintain its quota production in any month or months, premium payments will not be made until the accumulated deficit is made up by over-quota production. This condition will not prevail if deficits are due to major calamities, such as fires or floods. The government reserves the right to alter quotas, but all initial quotas once established shall not be raised. The plan is flexible, and permits application to specific requirements and special cases.

During 1941, Latin American copper deliveries totaled 412,973 tons, according to the Copper Institute. Copper production from

primary and secondary sources during January was 88,319 tons (revised), as compared with 88,463 tons in December.

The copper branch of WPB announced that scrap metal dealers' monthly reports, heretofore filled out on form PD-120 and forwarded to the copper branch, will hereafter be filled out on form PD-249 and sent to the Bureau of Mines.

## Non-Ferrous Prices

(Cents per lb. for early delivery)

Copper, Electrolytic <sup>1</sup>	12.00
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis <sup>2</sup>	8.25
Lead, Sa. Louis <sup>3</sup>	6.35

<sup>1</sup> Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. <sup>2</sup> Add 0.39c. for New York delivery. <sup>3</sup> Add 0.15c. for New York delivery.

## Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 15c.-16c. a lb.; No. 12 remelt No. 2, standard, 14.50c. a lb. NICKEL electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt; Asiatic, 16.50c. a lb., New York; American, 14c. a lb., f.o.b. smelter. QUICK-SILVER, \$191 and \$193 per 76 lb. flask, f.o.b. shipping point. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.



## LOW COST—HIGH SPEED

**MARVEL**

MARVEL 4-B shaper action high speed Hack Saw.  
Screw-feed. Ball-bearing saw frame.  
Quick action vise.  
Cuts 6" cold-rolled bar in 8 minutes  
—other sizes in proportionate time.

**MARVEL**

The performance of MARVEL 4-B is high speed cutting with low cost operation because it will out-cut any other saw in its price class. Has draw-cut and lift return giving blade longer life. Has accurate, rigid frame action, 6" x 6" capacity and a speed of 149 strokes per minute. MARVEL 4-B may be had with cabinet base and with 4 speeds.

**BUY FROM YOUR LOCAL DISTRIBUTORS**

Write for Bulletin about these low cost machines featuring speed and efficiency.

**ARMSTRONG-BLUM MFG. CO.**  
"The Hack Saw People"  
5700 Bloomingdale Ave.  
Chicago, U.S.A.  
Eastern Sales Office:  
225 Lafayette St., New York



# SCRAP

... MARKET ACTIVITIES AND PRICE TRENDS

## Seizures of Auto Graveyards Expected In Near Future

• • • The drive for auto graveyard scrap, which has made swift progress in the past two weeks, is now operating under a definite basis of procedure and within a short time outright seizures of the entire contents of graveyards can be expected in various key areas of the nation.

Last week the nation was divided into sectors for supervision of the graveyard program, and OPA devised "timetables" setting up its various steps against backward auto wreckers. A system of daily reports was devised. Definite offers will be made within 90 days for the purchase of all cars in the nation's graveyards that are located within reasonable distance of scrap consumers.

A form has been prepared which will show whether or not the graveyard owner has accepted the offer made to him for his cars, and if not, the price bid per ton. Owners of graveyards who accept offers will be allowed to keep "reasonable inventories" of parts. The iron and steel scrap moved through the effort will be subject to allocation among scrap-consuming companies.

Regional representatives are being appointed for each of the 15 regions into which the nation has been divided.

In view of the allocation proviso, scrap purchases made by one

company may be allocated by the Iron and Steel Branch to other companies whose need is greater or whose war production is more important.

The new report form contains such information as the name of the auto graveyard visited, the owner, the manager, how many cars were in the yard, how many cars the buyer offered to take, and other details which would be of use to the WPB in requisitioning the material in case the auto graveyard owner refused to sell at what was considered to be a fair price.

It is significant also that on this form a place exists for the offer made by the buyer for the cars per net ton, as well as any offers which might have been made for loose scrap, that is, scrap not in the form of old cars complete or partially dismantled. Provision is also made to indicate what price the auto wrecker asked for his material if he made such a counter offer.

The most important angle of this new form distributed among the steel mill representatives was the fourth copy which is returned to the automobile wrecker and on which is a notation telling him definitely that if the WPB feels that the price offered to him by a steel company or a broker for his scrap is a fair one and he has refused it, the government will take proper measures to move in and requisition the entire contents of the yard, including cars, loose scrap and parts. It is also indicated that the

scrap must be sold at a price which, plus the conversion charge, will mean a delivered price to the mill within the OPA's scrap price ceiling.

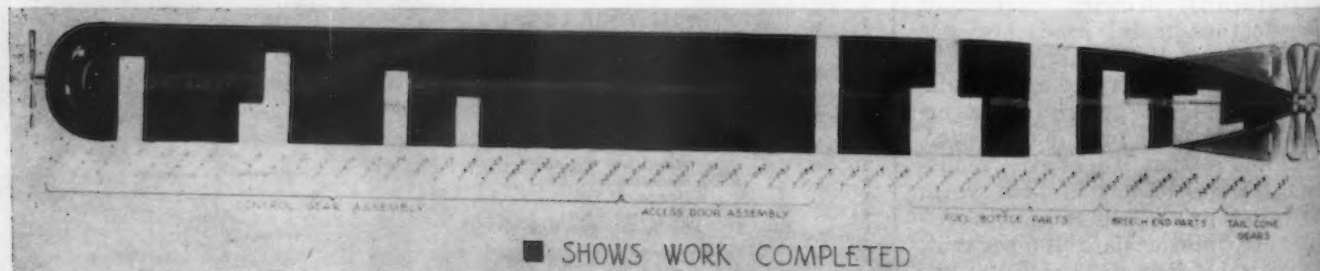
These pertinent forms for auto graveyard material, after being filled out are to be distributed as follows: One copy, the original, to the WPB, Bureau of Industrial Conservation, auto graveyard section; the second one, apparently to the local BIC office; the third to be retained by the buyer and bidder; and the fourth to be sent to the auto graveyard owner.

Slightly higher steel output schedules this week reflect the recent vigorous efforts by dealers and mills toward increasing the flow of scrap. Bad weather was an offsetting factor in some areas, however.

At Chicago steel producers are managing to keep furnaces going and are in about the same position as they were a month or six weeks ago. While some open hearths have resumed in several areas, six open hearths are still down at Lackawanna. Cincinnati reports that while several open hearths have gone down, the reduction was caused by needed repairs, rather than lack of scrap.

At Chicago disciplinary action against two members of the chapter of the Institute of Scrap Iron & Steel, Inc., for alleged violation of its quality standards which are identical with specifications set by OPA was voted by the executive committee of the chapter.

**PRODUCTION SPEED-UP AID:** This 7 ft. drawing of a torpedo was divided into sections, each representing a different part of the torpedo made by Porter-Cable Machine Co., Syracuse, N. Y. Each section is sub-divided into the required number of parts to be made, and as the parts are completed the section is painted red. This keeps workers informed of how others in the plant are doing and creates a spirit to get the job done quickly.





## District Scrap Markets

**CHICAGO**—Tin cans are more and more common in sales to local mills and other scrap purchasers. Meanwhile, local scrap circles are agog over reports of serious tampering with specifications by substitutions of substances so foreign to steel scrap that some furnaces are alleged to have been impaired when the so-called scrap was melted.

**PITTSBURGH**—Concerted nation-wide action is expected soon on the acquisition of automobile graveyard scrap following a meeting held in Pittsburgh last week by steel industry and government officials. Briefly, the plan means that when automobile wrecking yards are offered what is considered to be a fair price for their material and refuse to sell it, the government will move in and requisition the entire contents of the yard. It is believed the success of the "sample" collections from automobile yards in the Pittsburgh district several weeks ago prompted the nation-wide drive. The OPA, however, has definitely stated that automobile graveyard scrap delivered to steel mills shall not exceed the maximum ceiling prices on melting steel scrap. Scrap supplies are still far from plentiful here and conditions are not being bettered.

**CLEVELAND**—Republic Steel Corp. has been aggressively seeking auto yard scrap through its dealers, who undertake preparing it. The company says it is not following the action of some other steel companies who actually send their own labor crews into second hand auto yards.

**ST. LOUIS**—While sales by country dealers have been increasing steadily the total movement to this market was slowed this week because of rains in nearby territory. Some improvement in remote shipments is reported. Federal authorities allocated 3500 tons of foundry grades to the General Steel Castings Co. which dealers do not have on hand. An allocation several weeks ago of 15,000 tons of heavy melting steel to Granite City Steel Co. is also unfilled.

**CLEVELAND**—Prior to the price change, bundles of can scrap were being purchased out of this district by mills outside this area. It is reported users of the tin-can bundles were charging small amounts of such scrap into each heat without experiencing any serious operational difficulties. The \$5-\$8 reduction in price for bundles including tin-coated material, is said to be too severe and it may interfere with the continuation of salvage operations being conducted at dumps.

**BUFFALO**—Extreme cold weather has virtually stopped the sorting of scrap and receipts in this district have dropped off to between 50 and 60 per cent of the normal rate, dealers report. Scrap steel reclamation in the area's three largest auto "graveyards" was intensified and dealers shipped better than 3000 tons to Bethlehem's Lackawanna plant where six open

## For VICTORY—It Takes SCRAP IRON

We are Today Paying — delivered to our yard  
PER NET TON (2000 LBS.)

**\$13.00** for TIN CANS, GALVANIZED TIN and all other kinds of Tin Scrap

**\$14.00** for AUTOMOBILE BODIES AND FENDERS

**\$14.95** for ANY KIND OF MIXED SCRAP

**BUFFALO SASHWEIGHT & FOUNDRY CO., INC.**

SCRAP IRON AND METAL DEALERS  
THOMAS, WILLIAM and HOWARD STREETS  
WEIGH YOUR MATERIAL, BRING IT IN AND GET YOUR CASH  
1 BLOCK EAST OF FILLMORE, OFF HOWARD OR WILLIAM STREETS

**RECENT AD:** Buffalo citizens are being appealed to by large advertisements. The idea is not new but this particular ad aroused much interest.

hearths still are down for want of scrap. The aggregate amount of scrap being collected as result of a local public campaign is comparatively small.

**CINCINNATI**—Dealers in this area report a very definite tangible increase in the supply of scrap as the result of recent drives to uncover material. Further results were indicated by the fact that various auto wreckers are themselves putting pressure upon reluctant members of the trade to bring out more material for defense. Allocations, however, are becoming more and more needed.

**TORONTO**—Dealers reported difficulty in maintaining deliveries as a result of the recent heavy snow. The government is taking action to assist in providing urgently needed scrap. The Department of Munitions and Supply awarded a contract for removing trolley rails from three Montreal streets and repaving damaged roads. The material will be handled by Canadian Car & Foundry Co., Ltd., Montreal, for the steel controller.

## Much Arguing Needed To Pry Scrap Loose

Chicago

... A private individual in a Chicago suburb was found recently in possession of about 1500 tons of auto cast collected over the past 20 years. He was finally persuaded to sell by Maurice Bennett's Scrap and Steel Auto Wreckers' Committee, which has been hunting scrap. In another small town, a man with 175 tons in his back yard, put up a vigorous argument against parting with the material, but finally was induced to sell.

**BIRMINGHAM**—Little gain has been noted in the Birmingham area or in the adjoining states that supply this district after the government's announced intention of cleaning up auto graveyards. Additional pressure from Washington is considered necessary if any tangible benefit here is to be obtained.

**BOSTON**—Supplies are a little freer, but the movement is still hampered by extremely cold weather. The trucking charge is now \$1 a ton, down 50c. Where the rail rate is less than \$1, the trucking rate prevails. The loading barge rate is \$1.25 a ton, as against 75c. heretofore, and the barge shipping rate \$2.45, as against \$2.25. Adjusted rates on shipments by water do not really help the barge market for No. 1 steel because of the all rail shipping rate. They do, however, place the American Steel & Wire Co., Worcester, Mass., in a better position to obtain Boston district heavy melting steel.

**DETROIT**—A pressing shortage of scrap continues in the Detroit area with severe winter weather adding to collection difficulties. Ford has approximately 80 per cent of its furnaces in production but is likely to close several open hearths this week because of scrap shortage.

## C-1 Stack at Rankin Sets Record in January

Pittsburgh

... A new record for blast furnace production was established by the No. 3 Carrie Blast Furnace of Carnegie-Illinois Steel Corp., United States Steel subsidiary, when a total of 41,782 net tons of pig iron were produced during the month of January, the company announced. The performance of Carrie Furnace, which is located at Rankin, Pa., shattered a previous all time record of 41,701 net tons established by Carnegie-Illinois' No. 10 furnace at Gary, Ind., steel works in July, 1931.

## Work Starts Soon on Sheet & Tube Boiler House

Pittsburgh

... Construction will begin shortly on a \$1,000,000 boiler house for Youngstown Sheet & Tube Co. at South Chicago, Ill., it was announced by Rust Engineering Co., the contractors.

The new installation, consisting of three high-pressure boilers, will replace existing facilities which were built shortly after 1900 for the old Iroquois Iron Co. The plant is located on the Calumet River, where it flows into Lake Michigan.

## PRICES

(All the prices given below are per gross ton and are basing point prices from which shipping point prices and consumer's delivered prices are to be computed)

### IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

	BASIC OPEN HEARTH GRADES (No. 1 Heavy Melting; No. 1 Hydr. Com- pressed Black Sheets; No. 2 Heavy Melting; Dealers' No. 1 Bundles; Dealers' No. 2 Bundles; No. 1 Bushelling)			BLAST FURNACE GRADES (Mixed Borings and Turnings; Shovelling Turnings; No. 2 Bushelling; Cast Iron Borings)			ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES											
	Machine Shop Turnings			Low Phos.			Heavy Structural and Plate			Cut Auto. Steel Scrap			Alloy free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles			
				Billet, Bloom, Forge Crops	Bar Crops and Smaller	Punch- ings and Plate	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	1 ft. and Under						
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton.....	\$20.00	\$16.00	\$16.00	\$25.00	\$22.50	\$22.50	\$21.00	\$21.50	\$22.00	\$20.00	\$20.50	\$21.00	\$18.00	\$19.50	\$21.00			
Cleveland, Middletown, Cincinnati, Portsmouth.....	19.50	15.50	15.50	24.50	22.00	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50			
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt....	18.75	14.75	14.75	23.75	21.25	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75			
Ashland, Ky.....	19.50	15.50	15.50	24.50	22.00	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50			
Buffalo, N. Y.....	19.25	15.25	15.25	24.25	21.75	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25			
Bethlehem, Pa.; Kokomo, Ind., Duluth, Minn.....	18.25	14.25	14.25	23.25	20.75	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25			
Detroit, Mich.....	18.00	14.00	14.00	23.00	20.50	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00			
Toledo, Ohio.....	17.85	13.85	13.85	22.85	20.35	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85			
St. Louis, Mo.....	17.50	13.50	13.50	22.50	22.00	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50			
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	13.00	13.00	22.00	19.50	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00			
Minneapolis, Colo.....	16.50	12.50	12.50	21.50	19.00	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50			
Seattle, Wash.....	14.50	10.50	10.50	19.50	17.00	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50			
Portland, Ore.....					15.50	15.50	14.00	14.50	15.00	13.00	13.50	14.00	11.00	12.50	14.00			

**PITTSBURGH** basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport. Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakland, Cal.

**MAXIMUM** prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1, 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the corresponding open hearth grades.

**MAXIMUM SHIPPING POINT PRICE**—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad car or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. Published dock charges prevail, or if unpublished 75c. per ton must be included as part of the deduction.\* Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points, take price listed in table minus lowest switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.\* For exceptions see official order.

\*At Memphis deduct 50c.; Great Lakes ports \$1; New England \$1.25.

**REMOTE SCRAP:** Defined as all grades of scrap listed in table above located in North Dakota, South Dakota, Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon and Utah. The delivered price of remote scrap may exceed by more than \$1, but not more than \$5, the price at the basing point nearest the consumer's plant, provided detailed statement under oath is furnished OPA. Where delivered price would exceed by more than \$5 the price at basing point nearest consumer, user must apply to OPA for permission to absorb the additional charges. For exceptions see official order.

**UNPREPARED SCRAP:** The maximum prices established hereinabove are maximum prices for prepared scrap. For unprepared scrap, maximum prices shall be \$2.50 less than the maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order).

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed.

**CAST IRON BORINGS:** (No more than 0.5 per cent oil content; for chemical use in explosive making) add \$5 to price of cast iron borings; for chemical use outside explosives making, add \$3.

**UNPREPARED CAST IRON SCRAP**—Except for heavy breakable cast, unprepared scrap is given a price ceiling of \$2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their plants. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller a certification, made out to OPA, of the shipping point, transportation charges and details of the sale.

### RAILROAD SCRAP

(Per gross ton, delivered consumers' plants located on line.)

	Scrap Rails			Scrap Rails		
	No. 1 RR Heavy Melting	Scrap Rails	Rails for Re-rolling	3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown.....	\$20.50	\$21.50	\$23.00	\$23.50	\$23.75	\$24.00
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown....	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco.....	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo.....	18.00	19.00	20.50	21.00	21.25	21.50
Detroit.....	20.25	21.25	22.75	23.25	23.50	23.75
Duluth.....	18.95	19.95	21.35	21.85	22.10	22.35
Kansas City, Mo.....	19.00	20.00	21.50	22.00	22.25	22.50
Kokomo, Ind.....	17.00	18.00	19.50	20.00	20.25	20.50
Seattle.....	19.25	20.25	21.75	22.25	22.50	22.75
St. Louis.....	15.50	16.50	18.00	18.50	18.75	19.00
	18.50	19.50	21.00	21.50	21.75	22.00

### CAST IRON SCRAP

Other Than Railroad Scrap

	Group A	Group B	Group C
No. 1 cupola cast.....	\$18.00	\$19.00	\$20.00
No. 1 machinery cast, drop broken, 150 lbs. and under.....	18.00	19.00	20.00
Clean auto cast.....	18.00	19.00	20.00
Unstripped motor blocks.....	17.50	18.50	19.50
Stove Plate.....	17.00	18.00	19.00
Heavy Breakable Cast.....	15.50	16.50	17.50
Charging box size cast.....	17.00	18.00	19.00
Misc. Malleable.....	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: states not named in A and B; switch district of Kansas City, Kan., Mo.



# ... Comparison of Prices

(Advances Over Past Week in **Heavy Type**; Declines in *Italics*)

(Prices Are F.O.B. Major Basing Points)

Flat Rolled Steel:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Cents Per Lb.)				
Hot rolled sheets .....	2.10	2.10	2.10	2.10
Cold rolled sheets .....	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip .....	2.10	2.10	2.10	2.10
Cold rolled strip .....	2.80	2.80	2.80	2.80
Plates .....	2.10	2.10	2.10	2.10
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Dollars Per Base Box)				
Tin plate .....	\$5.00	\$5.00	\$5.00	\$5.00
Manufacturing ternes ..	4.30	4.30	4.30	4.30

Bars and Shapes:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Cents Per Lb.)				
Merchant bars .....	2.15	2.15	2.15	2.15
Cold finished bars .....	2.65	2.65	2.65	2.65
Alloy bars .....	2.70	2.70	2.70	2.70
Structural shapes .....	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00

Wire and Wire Products:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Cents Per Lb.)				
Plain wire .....	2.60	2.60	2.60	2.60
Wire nails .....	2.55	2.55	2.55	2.55

Rails:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Dollars Per Gross Ton)				
Heavy rails .....	\$40.00	\$40.00	\$40.00	\$40.00
Light rails .....	40.00	40.00	40.00	40.00

Semi-Finished Steel:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Dollars Per Gross Ton)				
Rerolling billets .....	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars .....	34.00	34.00	34.00	34.00
Slabs .....	34.00	34.00	34.00	34.00
Forging billets .....	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Cents Per Lb.)				
Wire rods .....	2.00	2.00	2.00	2.00
Skelp (grvd) .....	1.90	1.90	1.90	1.90

Pig Iron:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Per Gross Ton)				
No. 2 fdy., Philadelphia..	\$25.84	\$25.84	\$25.84	\$25.84
No. 2, Valley furnace ..	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti ..	24.06	24.06	24.06	24.06
No. 2, Birmingham ....	20.38	20.38	20.38	19.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa...	25.34	25.34	25.34	25.34
Basic, Valley furnace ...	23.50	23.50	23.50	23.50
Malleable, Chicago† ....	24.00	24.00	24.00	24.00
Malleable, Valley .....	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago...	31.34	31.34	31.34	30.34
Ferromanganese† .....	120.00	120.00	120.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.  
‡For carlots at seaboard.

Scrap:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Per Gross Ton)				
Heavy melting steel, P'gh.	\$20.00	\$20.00	\$20.00	\$21.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	20.00
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	19.25
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.75
Low phos. plate, Youngs'n	23.00	23.00	23.00	24.00
No. 1 cast, Pittsburgh...	22.00	22.00	22.00	22.25
No. 1 cast, Philadelphia .	24.00	24.00	24.00	23.75
No. 1 cast, Ch'go*	21.00	21.00	21.00	19.25

\*Changed to gross ton basis April 3, 1941.

Coke, Connelsville:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Per Net Ton at Oven)				
Furnace coke, prompt ...	\$6.00	\$6.00	\$6.125	\$5.50
Foundry coke, prompt ...	6.875	6.875	6.875	5.75

Non-Ferrous Metals:	Feb. 17, 1942	Feb. 10, 1942	Jan. 20, 1942	Feb. 18, 1941
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*..	12.00	12.00	12.00	12.00
Copper, Lake, New York.	12.00	12.00	12.00	12.00
Tin (Straits), New York.	52.00	52.00	52.00	51.75
Zinc, East St. Louis.....	8.25	8.25	8.25	7.25
Lead, St. Louis .....	6.35	6.35	6.35	5.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

\*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 130 to 136 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

# ... Composite Prices

FINISHED STEEL		PIG IRON		SCRAP STEEL	
Feb. 17, 1942 .....	2.30467c. a Lb.....	\$23.61 a Gross Ton.....	\$19.17 a Gross Ton.....	\$19.17 a Gross Ton.....	\$19.17 a Gross Ton.....
One week ago .....	2.30467c. a Lb.....	\$23.61 a Gross Ton.....	\$19.17 a Gross Ton.....	\$19.17 a Gross Ton.....	\$19.17 a Gross Ton.....
One month ago .....	2.30467c. a Lb.....	\$23.61 a Gross Ton.....	\$19.17 a Gross Ton.....	\$19.17 a Gross Ton.....	\$19.17 a Gross Ton.....
One year ago .....	2.30467c. a Lb.....	\$23.45 a Gross Ton.....	\$20.08 a Gross Ton.....	\$20.08 a Gross Ton.....	\$20.08 a Gross Ton.....

High		Low		High		Low		High		Low	
1941.....	2.30467c.,	2.30467c.,	\$23.61, Mar. 20	\$23.45, Jan. 2	\$22.00, Jan. 7	\$19.17, Apr. 10					
1940.....	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9					
1939.....	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16					
1938.....	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7					
1937.....	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10					
1936.....	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9					
1935.....	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29					
1934.....	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25					
1933.....	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3					
1932.....	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5					
1931.....	1.99629c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29					
1930.....	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9					
1929.....	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3					

A weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip. These products represent 78 per cent of the United States output. This revised index recapitulated to 1929 in the Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

# Prices of Finished Iron and Steel . . .

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
<b>SHEETS</b>															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled <sup>1</sup>	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes <sup>2</sup>	3.80¢		3.80¢									-4.55¢			
<b>STRIP</b>															
Hot rolled <sup>3</sup>	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled <sup>4</sup>	2.80¢	2.90¢					2.80¢	(Worcester = 3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
<b>TIN PLATE</b>															
Standard cokes, base box	\$5.00	\$5.00	\$5.00						\$5.10						\$5.32
<b>BLACK PLATE</b>															
29 gage <sup>5</sup>	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ ( <sup>10</sup> )			3.37¢
<b>TERNES, M'FG.</b>															
Special coated, base box	\$4.30	\$4.30	\$4.30						\$4.40						
<b>BARS</b>															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel <sup>6</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢	
Reinforcing (rail) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢	2.25¢		2.47¢
Cold finished <sup>8</sup>	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					3.01¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢		(Bethlehem, Massilon, Canton = 2.70¢)					2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
										(Coatesville and Claymont = 2.10¢)					
<b>PLATES</b>															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢( <sup>11</sup> )		2.45¢	2.65¢	2.25¢	2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢				(Coatesville = 3.50¢)					3.95¢	4.15¢		3.70¢	3.37¢
<b>SHAPES</b>															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
<b>SPRING STEEL, C-R</b>															
0.26 to 0.50 Carbon	2.80¢			2.80¢				(Worcester = 3.00¢)							
0.51 to 0.75 Carbon	4.30¢			4.30¢				(Worcester = 4.50¢)							
0.76 to 1.00 Carbon	6.15¢			6.15¢				(Worcester = 6.35¢)							
1.01 to 1.25 Carbon	8.35¢			8.35¢				(Worcester = 8.55¢)							
<b>WIRE<sup>9</sup></b>															
Bright	2.60¢	2.60¢		2.60¢	2.60¢			(Worcester = 2.70¢)				3.10¢			2.92¢
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢			(Worcester = 2.70¢)				3.10¢			2.92¢
Spring	3.20¢	3.20¢		3.20¢				(Worcester = 3.30¢)				3.80¢			3.52¢
<b>PILING</b>															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢
<b>IRON BARS<sup>12</sup></b>															
Wrought single refined	4.40¢														
Wrought double refined	5.40¢														

<sup>1</sup> Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. <sup>2</sup> Unassorted 8-lb. coating. <sup>3</sup> Widths up to 12 in. <sup>4</sup> Carbon 0.25 per cent and less. <sup>5</sup> Applies to certain width and length limitations. <sup>6</sup> For merchant trade. <sup>7</sup> Straight lengths as quoted by distributors. <sup>8</sup> Also shafting. For quantities of 20,000 to 39,999 lb. <sup>9</sup> Carload lot to manufacturing trade. <sup>10</sup> Boxed. <sup>11</sup> Ship plates only. <sup>12</sup> Common iron bars quoted at 2.15c. by Terre Haute, Ind., producer. \*\* Gulf and Pacific Ports prices shown here do not apply if the customary means of transportation (rail and water) is not used.



# PRICES

## SEMI-FINISHED STEEL

### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2 higher; f.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton  
Rerolling .....\$34.00  
Forging quality ..... 40.00

### Shell Steel

Basic open hearth shell steel, f.o.b. Pittsburgh and Chicago.

Per Gross Ton  
3 in. to 12 in. ....\$52.00  
12 in. to 18 in. .... 54.00  
18 in. and over. .... 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity.

### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton  
Open hearth or bessemer. ....\$34.00

### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.  
Grooved, universal and sheared 1.90c.

### Wire Rods

(No. 5 to 9/32 in.) Per Lb.  
Pittsburgh, Chicago, Cleveland. 2.00c.  
Worcester, Mass. .... 2.10c.  
Birmingham .... 2.00c.  
San Francisco .... 2.50c.  
Galveston .... 2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

### Alloy Steel Blooms, Billets and Slabs

Per Gross Ton  
Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem .....\$54.00

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse) Base per Lb.

High speed ..... 67c.  
Straight molybdenum ..... 54c.  
Tungsten-molybdenum ..... 57½c.  
High-carbon-chromium ..... 43c.  
Oil hardening ..... 24c.  
Special carbon ..... 22c.  
Extra carbon ..... 18c.  
Regular carbon ..... 14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

## PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices are delivered quotations per gross ton computed on the basis of the official maxima.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorous	Charcoal
Boston.....	\$25.50	\$25.00	\$26.50	\$26.00	.....	.....
Brooklyn.....	27.50	.....	.....	28.00	.....	.....
Jersey City.....	26.53	26.03	27.53	27.03	.....	.....
Philadelphia.....	25.84	25.34	26.84	26.34	.....	.....
Bethlehem, Pa.....	\$25.00	\$24.50	\$26.00	\$25.50	.....	.....
Everett, Mass.....	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.....	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.....	.....	24.50	.....	.....	\$29.50	.....
Birdsboro, Pa.....	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.....	25.00	24.50	.....	.....	.....	.....
Erie, Pa.....	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.....	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo.....	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati.....	24.44	24.61	.....	25.11	.....	.....
Canton, Ohio.....	25.39	24.89	25.89	25.39	.....	.....
Mansfield, Ohio.....	25.94	25.44	26.44	25.94	.....	.....
St. Louis.....	24.50	24.02	.....	.....	.....	.....
Chicago.....	24.00	23.50	24.50	24.00	.....	\$31.34
Granite City, Ill.....	24.00	23.50	24.50	24.00	.....	.....
Cleveland.....	24.00	23.50	24.50	24.00	.....	.....
Hamilton, Ohio.....	24.00	23.50	.....	24.00	.....	.....
Toledo.....	24.00	23.50	24.50	24.00	.....	.....
Youngstown.....	24.00	23.50	24.50	24.00	.....	.....
Detroit.....	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.....	.....	.....	.....	.....	.....	\$28.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul.....	26.63	.....	27.13	26.63	.....	.....
Duluth.....	24.50	.....	25.00	24.50	.....	.....
Birmingham.....	20.38	19.00	25.00	.....	.....	.....
Los Angeles.....	27.50	.....	.....	.....	.....	.....
San Francisco.....	27.50	.....	.....	.....	.....	.....
Seattle.....	27.50	.....	.....	.....	.....	.....
Provo, Utah.....	22.00	.....	.....	.....	.....	.....
Montreal.....	27.50	27.50	.....	28.00	.....	.....
Toronto.....	25.50	25.50	.....	26.00	.....	.....

## GRAY FORGE IRON

Valley or Pittsburgh furnace ..... \$23.50

\*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable. E. & G. Brooke Iron Co., Birdsboro, Pa., is permitted to charge \$1 in excess of maximums specified in Price Schedule No. 10.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade (1.75 per cent to 2.25 per cent).

Phosphorous Differential: Basing point prices are subject to a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over.

†Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace.

Manganese Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

## WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. See THE IRON AGE, Dec. 25, 1941, page 88, for details of OPA Price Schedule No. 49, covering steel resale prices. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. city prices are used in conformance with Schedule 49.)

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled.....	\$3.35	\$3.25	\$3.35	\$3.75	\$3.58	\$3.43	\$3.25	\$3.71	\$3.45	\$3.39	\$3.50	\$3.38	\$4.65
Sheets, cold rolled.....	.....	4.10	4.05	4.05	4.60	4.30	4.30	4.68	.....	4.24	4.90	4.23	6.85
Sheets, galvanized.....	4.65	4.85	4.62	5.00	5.00	4.84	4.75	5.11	4.75	4.99	5.00	4.98	5.85
Strip, hot rolled.....	3.60	3.60	3.50	3.95	3.96	3.68	3.82	4.06	3.70	3.74	3.85	3.73	5.00
Strip, cold rolled.....	3.20	3.50	3.20	3.31	3.51	3.40	3.52	3.46	.....	3.61	3.83	3.54	.....
Plates.....	3.40	3.55	3.40	3.75	3.76	3.60	3.62	3.85	3.55	3.69	3.80	3.68	4.50
Structural shapes.....	3.40	3.55	3.58	3.75	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.50
Bars, hot rolled.....	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	4.50
Bars, cold finished.....	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300.....	7.45	7.35	7.55	7.31	7.60	7.67	7.35	7.75	.....	7.72	7.45	7.58	9.55
Bars, ht. rld. SAE 3100.....	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300.....	8.40	8.40	8.40	8.56	8.84	8.70	8.40	8.88	.....	8.77	8.84	8.63	10.55
Bars, cd. drn. SAE 3100.....	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	9.55

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb., cold rolled strips, 0.0971 in. thick; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., cold rolled strip 0.095 in. and lighter; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. \*12 gage and heavier, \$3.43.

## PRICES

### CORROSION AND HEAT- RESISTING STEELS

(Per lb. base price, f.o.b. Pittsburgh)

#### Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets .....	21.25c.	20.40c.
Bars .....	25.00c.	24.00c.
Plates .....	29.00c.	27.00c.
Structural shapes .....	25.00c.	24.00c.
Sheets .....	36.00c.	34.00c.
Hot rolled strip .....	23.50c.	21.50c.
Cold rolled strip .....	30.00c.	28.00c.
Drawn wire .....	25.00c.	24.00c.

#### Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets 15.73c.	16.15c.	19.13c.	23.38c.	
Bars .. 18.50c.	19.00c.	22.50c.	27.50c.	
Plates .. 21.50c.	22.00c.	25.50c.	30.50c.	
Sheets .. 26.50c.	29.00c.	32.50c.	36.50c.	
Hotstrip 17.00c.	17.50c.	24.00c.	25.00c.	
Cold st.. 22.00c.	22.50c.	32.00c.	52.00c.	

#### Chromium-Nickel Clad Steel (20%)

	No. 304
Plates .....	18.00c.*
Sheets .....	19.00c.

\* Includes annealing and pickling.

### ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade .....	3.20c.
Armature .....	3.55c.
Electrical .....	4.05c.
*Motor .....	4.95c.
*Dynamo .....	5.65c.
Transformer 72 .....	6.15c.
Transformer 65 .....	7.15c.
Transformer 58 .....	7.65c.
Transformer 52 .....	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 75c. per 100 lb.

\* In some instances motor grade is referred to as dynamo grade and dynamo grade is referred to as dynamo special.

### ROOFING TERNE PLATE

(F.o.b. Pittsburgh, per  
Package of 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C..	\$6.00	\$12.00
15-lb. coating I.C..	7.00	14.00
20-lb. coating I.C..	7.50	15.00
25-lb. coating I.C..	8.00	16.00
30-lb. coating I.C..	8.63	17.25
40-lb. coating I.C..	9.75	19.50

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

#### Machine and Carriage Bolts:

6½ in., shorter and smaller...	65½
6 x ¾ in., and shorter.....	63½
6 in. by ¾ to 1 in. and shorter..	61
1½ in. and larger, all length..	59
All diameters over 6 in. long..	59
Lag, all sizes.....	62
Plow bolts .....	65

#### Nuts, Cold Punched or Hot Pressed:

(hexagon or square)

½ in. and smaller.....	62
9/16 to 1 in. inclusive.....	59
1½ to 1½ in. inclusive.....	57
1½ in. and larger.....	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller...	64	
½ in. and smaller....	62	
¾ in. through 1 in....	60	
9/16 to 1 in.....	59	
1½ in. through 1½ in..	57	58
1½ in. and larger.....	56	

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	71 and 10
Stove bolts in packages, with nuts attached .....	71
Stove bolts in bulk.....	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York lots of 200 lb. or over.

#### Large Rivets

(½ in. and larger)

Base per 100 lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....	\$3.75
---	--------

#### Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....	65 and 5
---	----------

#### Cap and Set Screws

Per Cent Off List

Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller .....	60
Upset set screws, cup and oval points .....	68
Milled studs .....	40
Flat head cap screws, listed sizes	30
Filister head cap, listed sizes...	46

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

### WIRE PRODUCTS

(To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg

Standard wire nails.....	\$2.55
Coated nails .....	2.55
Cutnails, carloads .....	3.85

Base per 100 Lb.

Annealed fence wire..... \$3.05

Base Column

Woven wire fence*.....	67
Fence posts (carloads).....	69
Single loop bale ties.....	59
Galvanized barbed wire†.....	70
Twisted barbless wire.....	70

\* 15½ gage and heavier. † On 80-rod spoons in carload quantities.

Note: Birmingham base same on above items, except spring wire.

### BOILER TUBES

Seamless Steel and Lap Weld Commercial  
Boiler Tubes and Locomotive Tubes

Minimum Wall

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless	Lap Weld	Cold Hot	Hot
	Drawn	Roll	Roll	Roll
	\$	\$	\$	\$
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38	
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58	
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35	
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15	
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66	

(Extras for less carload quantities)

40,000 lb. or ft. over .....	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.....	65%

### STEEL AND WROUGHT IRON PIPE AND TUBING

#### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District  
and Lorain, Ohio, Mills  
(F.o.b. Pittsburgh only on wrought pipe)

Base Price = \$200 Per Net Ton

#### Steel (Butt Weld)

	Black	Galv.
½ in. ....	63½	51
¾ in. ....	66½	55
1 to 3 in.....	68½	57½

#### Wrought Iron (Butt Weld)

½ in. ....	24	3½
¾ in. ....	30	10
1 and 1¼ in.....	34	16
1½ in. ....	38	18½
2 in. ....	37½	18

#### Steel (Lap Weld)

2 in. ....	61	49½
2½ and 3 in.....	64	52½
3½ to 6 in.....	66	54½

#### Wrought Iron (Lap Weld)

2 in. ....	30½	12
2½ to 3½ in.....	31½	14½
4 in. ....	33½	18
4½ to 8 in.....	32½	17

#### Steel (Butt, extra strong, plain ends)

	Black	Galv.
½ in. ....	61½	50½
¾ in. ....	65½	54½
1 to 3 in.....	67	57

#### Wrought Iron (Same as Above)

½ in. ....	25	6
¾ in. ....	31	12
1 to 2 in.....	38	19½

#### Steel (Lap, extra strong, plain ends)

2 in. ....	59	48½
2½ and 3 in.....	63	52½
3½ to 6 in.....	66½	56

#### Wrought Iron (Same as Above)

2 in. ....	33½	15½
2½ to 4 in.....	39	22½
4½ to 6 in.....	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld 8 in. and smaller.

### CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago...	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham ..	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle .....	56.00

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago.

### FUEL OIL

No. 3, f.o.b. Bayonne, N. J.....	5.20c.
No. 6, f.o.b. Bayonne, N. J.....	3.21c.
No. 6 Bur. Stds., del'd Chicago..	4.50c.
No. 3 distillate del'd Cleveland..	6.50c.
No. 4 indus., del'd Cleveland....	6.00c.
No. 6 indus., del'd Cleveland...	5.00c.



# When U.S. Production Fights Its Battle at Sea



... FIBREEN protects the materials of war ... on deck and below ... against the hazards of transportation



FIBREEN is 6 ply: TWO layers of strong kraft, reinforced with TWO layers of crossed sisal fibers embedded in TWO layers of special asphalt—all combined under heat and pressure. FIBREEN is pliable and clean—will not scuff—stands an astonishing amount of abuse and exposure. Used either as a wrapping or lining material.

Soak it—twist it—try to tear it.

Only when you get a sample in your own hands can you realize that a paper can be so strong—so tough—and impervious to moisture. There is no other material like FIBREEN. In rolls and blankets of many widths.



A product of The Sisalkraft Co.—manufacturers of Sisalkraft, Sisal-X, Sisal-Tape and Copper-Armored Sisalkraft.

Long before shipments of war materials reach the front, they face the destructive onslaught of rain, waves, flying salt spray—possibly a dry, scorching sun—or snow and piercing cold. Protection against these hazards of transit is as necessary as armed protection against enemy submarines or bombers.

This protection must be made at the factory in the shipping room—and FIBREEN is recognized as one of the most effective, practical materials that can be used for protective packing. It is used as a liner for cases or as a tough, weatherproof wrapping. FIBREEN meets the most severe specifications and inspections. It's pliable, clean, inexpensive, is absolutely waterproof—amazingly strong, tough and durable.

Because of these qualities—and because of the vital importance of properly protecting the vast stores of war materials that pour from American production lines—finished goods, materials and supplies; as well as machines, tools or parts shipped from one plant to another—FIBREEN is now being allotted entirely to uses essential to the nation's war program.

Inquiry is invited from those industries that are in the "essential" classifications. Write, stating what you ship and how you now pack it.

THE  
**SISALKRAFT CO.**  
205 W. WACKER DRIVE • CHICAGO, ILL.  
NEW YORK • SAN FRANCISCO • LONDON • SYDNEY



SERVING INDUSTRY . . .

. . . CONSTRUCTION AND AGRICULTURE THROUGHOUT THE WORLD

# PRICES

## FERROALLOYS

### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads).....\$120.00

### Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....\$36.00  
Domestic, 26 to 28%..... 49.50

### Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)

50% (carload lots, bulk).....\$74.50  
50% (ton lots, packed)..... 87.00  
75% (carload lots, bulk).....135.00  
75% (ton lots, packed).....151.00

### Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 \$4)

F.O.B. Jackson, Ohio.....\$29.50\*  
Buffalo .....30.75\*  
For each addition 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.  
\*Official OPACS price established June 24.

### Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

### Ferrochrome

(Per Lb., Contained Cr, Delivered Carlots, Lump Size, on Contract)

4 to 6 carbon.....13.00c.  
2 carbon .....19.50c.  
1 carbon .....20.50c.  
0.10 carbon .....22.50c.  
0.06 carbon .....23.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

### Silico-Manganese

(Per Gross Ton, Delivered, Lump Size, Bulk, on Contract)

3 carbon .....\$113.00\*  
2.50 carbon ..... 118.00\*  
2 carbon ..... 123.00\*  
1 carbon ..... 133.00\*

### Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload....\$ 2.00  
Ferrotungsten, 100 lb. and less 2.25  
Ferrovanadium, contract, per lb. contained V, del'd \$2.70 to \$2.90†  
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots..... \$2.25†  
Ferrocarbontitanium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload, contract, net ton .....\$142.50  
Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload, contract, net ton .....\$157.50

Ferrophosphorus, electric or blast furnace material, carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage freight, equaled with Rockdale, Tenn., gross ton..... \$58.50

Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage, freight equalized with Nashville, gross ton..... \$75.00

Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.

Calcium molybdate, per lb. Mo, f.o.b. furnace ..... 80c.

Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa.... 80c.

Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa. 80c.

\*Spot prices are \$5 per ton higher.  
†Spot prices are 10c. per lb. of contained element higher.

## ORES

### Lake Superior Ores (51.50% Fe.)

(Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer, 51.50.....\$4.75  
Old range, non-bessemer, 51.50. 4.60  
Mesaba, bessemer, 51.50..... 4.60  
Mesaba, non-bessemer, 51.50.... 4.45  
High phosphorus, 51.50..... 4.35

### Foreign Ores\*

(C.A.f. Philadelphia or Baltimore, Exclusive of Duty)

Per Unit

African, 46-48 Mn.....66.5c. to 68c.  
Indian, 48-50 Mn. ....68c. to 70c.

Brazilian, 46-48 Mn.....67c. to 68c.  
Cuban, 51 Mn. ....81c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered....\$24 to \$26  
Tungsten, domestic scheelite, at mine .....\$24.00 to \$25.00  
Chrome ore, lump, c.i.f. Atlantic Seaboard, per gross ton;  
South African (low grade) ..\$28.00  
Rhodesian, 45 .....Nom.  
Rhodesian, 48 .....Nom.

\*Importations no longer readily available. Prices shown are nominal.

## COKE\*

### Furnace

Per Net Ton

†Connellsville, prompt .....\$6.00

### Foundry

†Connellsville, prompt..\$6.75 to \$7.00

\*Maximum by-product coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, p. 94B. Maximum beehive furnace coke prices established by OPA, Jan. 26. †F.O.B. oven.

By-product, Chicago .....\$12.25  
By-product, New England.....\$13.75  
By-product, Newark. \$12.40 to \$12.95  
By-product, Philadelphia .....\$12.38  
By-product, Cleveland .....\$12.30  
By-product, Cincinnati .....\$11.75  
By-product, Birmingham .....\$8.50†  
By-product, St. Louis.....\$12.02  
By-product, Buffalo .....\$12.50

## RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton.....\$40.00  
Angle bars, 100 lb..... 2.70  
(F.o.b. Basing Points) Per Gross Ton  
Light rails (from billets).....\$40.00  
Light rails (from rail steel)... 39.00

Base per Lb.

Cut spikes ..... 3.00c.  
Screw spikes ..... 5.15c.  
Tie plates, steel ..... 2.15c.  
Tie plates, Pacific Coast..... 2.30c.  
Track bolts, heat treated, to railroads ..... 5.00c.  
Track bolts, jobbers discount.. 63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

## FLUORSPAR

### Fire Clay Brick

Per Net Ton

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail .....\$25.00  
Domestic, f.o.b. Ohio River landing barges ..... 25.00  
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines ..... 25.00  
Foreign, 85% calcium fluoride, not over 5% Si, c.i.f. Atlantic ports, duty paid.....Nominal  
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....\$34.00  
As above, in bags, f.o.b. same mines ..... 36.40

## REFRACTORIES

(F.o.b. Works)

### Fire Clay Brick

Per 1000

Super-duty brick, St. Louis...\$64.60  
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois ..... 51.30  
First quality, New Jersey.... 56.00  
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois ..... 46.55  
Second quality, New Jersey... 51.00  
No. 1, Ohio.....43.00  
Ground fire clay, net ton..... 7.60

### Silica Brick

Pennsylvania .....\$51.30  
Chicago District ..... 58.90  
Birmingham ..... 51.30  
Silica cement, net ton (Eastern) 9.00

### Chrome Brick

Per Net Ton

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester...\$54.00  
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. .... 54.00

### Magnesite Brick

Standard f.o.b. Baltimore and Chester .....\$76.00  
Chemically bonded, f.o.b. Baltimore ..... 65.00

### Grain Magnesite

Domestic, f.o.b. Baltimore and Chester in sacks.....\$44.00  
Domestic, f.o.b. Chewelah, Wash. (in bulk)..... 22.00